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THE BIRDS OF CELEBES

AND

THE NEIGHBOURING ISLANDS.

BY

A. B. MEYER AND L. W. WIGLESWORTH.

VOLUME II.

WITH 28 COLOURED PLATES.

BERLIN:

R. FRIEDLÄNDER & SOHN.

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BIBLIOTHECA
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ORDER PASSERES (continued).

FAMILY LANIIDAE.

A clear line of demarkation between the Shrikes and the Flycatchers has not yet been discovered. The true Shrikes are easily recognised by their strong semi-raptorial bill, armed with a hooked tip and a tooth. The young of these wear a barred plumage. On the other hand it is hard to distinguish *Pachycephala* from a Flycatcher, such as *Siphia*, though the bill of the former is stronger, the culmen being a trifle higher at the base, and the young do not wear a squamose plumage. Dr. Gadow (1883) divides this ill-defined family into five subfamilies, of which two, the *Laniinae* and *Pachycephalinae*, occur in Celebes. The best mark of distinction between these two groups seems to be afforded by the nostril: in the *Laniinae* it is "round and completely ossified"; in the *Pachycephalinae* it is "in a coriaceous groove, with an imperfect operculum"; in the former pure no tints of either red, blue, nor yellow occur; in the latter neither red nor blue, but pure yellow is frequent on the under surface.

Of late years a number of species of the family have been added to the Celebes Province. The *Pachycephalae*, of which there are in the Celebes area six species, have most likely been distributed by flight. The genus is found in the Indian and Australian regions as far as Central Polynesia, and Papuasia possesses one-half of the species, whilst only one, if indeed it is a *Pachycephala*, is found as far as Burmah and Bengal. At the same time the Great Sunda Islands and Philippines furnish a large proportion of the less specialized forms (see *H. sulfuriventer*). The two *Lanii* of Celebes are migratory species from E. Asia. The *Collurincla* of Great Sangi belongs to an Australasian genus which appears to have spread its range by flight.

GENUS PACHYCEPHALA Vig. Horsf.

Bill stronger than in the *Muscicapidae*, but less strong than in *Lanius*, measured across the anterior end of the nostril about as high as it is broad; nostril oval, formed posteriorly of a coriaceous membrane, a few frontal hairs or plumes reaching over it; a few long rictal bristles; tail square, shorter than the wing; 3rd—6th quills longest; tarsus and toes moderately large, tarsus scutellated, as long or longer than the middle toe and claw. The sexes in many forms dissimilar. Young generally more or less like adult female. The genus is pre-eminently Australian, but a few species are known from the Oriental Region.

* 142. PACHYCEPHALA SULFURIVENTER (Tweedd.).

Northern Grey-breasted Thick-head.

Plate XVIII.

a. **Hyloterpe sulfuriventra** *(1)* Wald., Ann. & Mag. N. H. 1872, (4) IX, 399; *(2)* id., Tr. Z. S. 1872, VIII, 117; *(3)* Meyer, J. f. O. 1873, 405; *(4)* W. Blas., J. f. O. 1883, 137.

b. **Hyloterpe sulphuriventris** *(1)* Wald., Tr. Z. S. 1875, IX, 179; *II* Gould's B. Asia II, in text to pl. 12.

c. **Pachycephala sulfureiventris** *(1)* Brügg., Abh. Ver. Bremen 1876, V, 69.

Pachycephala sulfuriventer *(1)* Gadow, Cat. B. VIII, 1883, 221; *(2)* Büttik., Notes Leyd. Mus. 1893, 168 *(sulfureiventer)*; *(3)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 10; *(4)* iid., ib. 1896, Nr. 1, p. 5.

d. **Hyloterpe sulphuriventer** *(1)* Sharpe, Ibis 1887, 451; *(2)* Everett, J. Str. Br. R. A. S. 1889, 122.

"Kios", Minahassa, Nat. Coll.

Adult. Head above and neck greyish olive-brown; the upper surface olive washed with yellowish, yellower on the upper tail-coverts, tail dusky washed with yellow-olive, exposed parts of wing-coverts and outer edges of quills paler, the tips of the greater wing-coverts palest, almost forming a bar; lores, orbital region, and ear-coverts paler brown than the head above; chin, throat and jugulum greyish white becoming olivaceous grey on sides of chest and upper breast; remaining underparts sulphur-yellow, very intense on the under tail-coverts; under wing-coverts and inner edges of quills below where they rest upon the body buffy white; rest of quills below dusky drab; tail below dusky drab, washed with yellow (♂, Crater-forest of Mt. Klabat, 5700 feet ca., 26. Sept. 1893: Sarasin Coll.). "Iris dark brown, bill black, feet slate-colour" (Sarasins).

Female. Not known to differ from the male. Less grey on the head?

Young. Younger birds seem to have less of a grey tinge on the head.

Remarks. The above-described male agrees with seven other specimens in the Sarasin Coll. and Dresden Museum from the hill-country of the Minahassa, but the olive tint of the head is duskier and greyer. These differences are probably due to age in part, but very likely in part also to locality.

A specimen in the Sarasin Collection from the Lake of Matanna, discovered by the travellers in South-east Central Celebes, does not seem to differ from birds from the North Peninsula. Wing 84 mm.

Measurements.	Wing	Tail	Tarsus	Bill from nostril
a. (Sarasin Coll.) ♂, Mt. Klabat, 26. IX. 93. . . .	84	63	20	9
b. (C 10813) ad., Tondano, Aug.—Sept.	79	61	—	8.5
c. (C 10815) ad., Tondano, Aug.—Sept.	82	58	20	—
d. (C 10814) ad., Tondano, Aug.—Sept.	78	62	—	8.5
e. (Sarasin Coll.) ♂ ad., Tomohon, 8. X. 94	82	61	20	9
f. (Sarasin Coll.) ♂ — Tomohon, 2. IV. 95	83	61	—	—
g. (Sarasin Coll.) ♀ — Tomohon, 7. IV. 94	81	62	20	8.5
h. (Sarasin Coll.) ♂ — Rurukan, 4. X. 94	85	—	—	—

Distribution. North Celebes (Meyer *a 1*, *a 3*), near Tondano (Nat. Coll.), Mt. Klabat (Sarasins), Tomohon and Rurukan (iid.), Lake Matanna (iid.).

Judging from its rarity in collections we conclude that this species is an inhabitant of the mountains. The exact localities of the specimens obtained by Meyer and those in the Darmstadt and Leyden Museums have not been recorded, but the Drs. Sarasin obtained it in the crater itself of Mount Klabat, and in the neighbourhood of Tomohon c. 2500—3000 ft., and our native collectors sent it only from the neighbourhood of Lake Tondano, which lies at an altitude of over 2000 feet. Its stomach was found by the Drs. Sarasin to contain insects.

P. sulfuriventer belongs to the group of *Pachycephalae* which have been separated as a distinct genus, *Hyloterpe* Cab. (=*Muscitrea* Blyth, of the same date, 1847), a group in which the sexes are alike in coloration. Over a dozen species of this group are now known, ranging from Bengal throughout the East Indies as far as New Guinea, viz:

P. grisola (Blyth), (*Muscitrea* ap. Oates), Burmah and the Andamans to Borneo, Java and Lombok;
P. brunneicauda (Salvad.), Sumatra;
P. whiteheadi Sh. (*P. plateni* W. Blas.), Palawan;
P. philippinensis Tw., Philippines;
P. homeyeri W. Blas., Sooloo;
P. hypoxantha Sh., Borneo;
P. sulfuriventer Wald., N. Celebes;
P. meridionalis Büttik., S. Celebes;
P. teijsmanni Büttik., S. Celebes and Saleyer;
P. orpheus Jard., Timor, Saleyer, Samao;
P. phaenonota (S. Müll.), Moluccas;
P. griseiceps Gray, Papuasia;
P. jobiensis Meyer, Jobi;
P. miosnomensis Salvad., Miosnom;

to which some others would have to be added in a complete list of the group.

Not only are the sexes in the *Hyloterpe*-group, so far as is known, alike, but, as Lord Tweeddale has pointed out *(b 1)*, "they possess this further peculiarity, that they wear, in adult plumage, a sombre garb recalling the adolescent and the female plumage of the true black-and-yellow *Pachycephalae*", a proof, it would seem, that the latter have departed from, while *Hyloterpe* retains, an ancestral type of dress. (See *Loriculus*, pp. 160—169.)

Not counting the next species, *P. meridionalis* Büttik. of S. Celebes, which may ultimately be found to intergrade with the present form from the north of the island, *P. sulfuriventer* is most nearly allied to *P. philippinensis* Tweedd. of the Philippines — Luzon (Meyer), Dinagat, (Brit. Mus.), Basilan and Siquijor and Samar (Steere), Mindanao (Platen). Above, this species "differs by its plumage being olive-green, and not brown, and underneath by the yellow extending higher, and being much brighter. The bill is likewise more powerful"

(Tweedd. *b 1*). *P. hypoxantha* (Sharpe) of Mt. Kini Balu, Borneo, is also a near relative of the North Celebesian Thickhead, but has the entire under surface yellow (Sharpe *d 1*).

* 143. PACHYCEPHALA MERIDIONALIS Bütt.

Southern Grey-breasted Thick-head.

Pachycephala meridionalis *(1)* Büttik., Notes Leyden Mus. XV, 1893, 168; *(2)* Hart., Nov. Zool. 1896, 155; *(3)* id., ib. 1897, 158.

Adult. Differs from *P. sulfuriventer* of North and Central Celebes by having the yellow on the abdomen much paler (straw-yellow as against canary-yellow) and less extended, not passing on to the lower breast; under tail-coverts canary-yellow; the olive-grey of the breast more extended; size slightly larger. (♂, Loka, S. Cel., 7. X. 95: Sarasin Coll.) "Iris deep chestnut-brown; feet dark purplish, claws black; beak black (Doherty *3*).

Remark. Mr. Büttikofer speaks of the upper surface as being "reddish brown, with hardly any tinge of the olive which characterizes the northern form" *(1)*, but this difference is not to be seen in the above specimen. Two others, also from Loka, display a duller brown tint above and a whiter tint on the abdomen, but this effect seems to be due to their having been placed before skinning in spirit — at least a similar effect is produced by spirit on some other birds, for instance, *Zosterops*.

Female. A female (imm.?) is slightly clearer, brighter olivaceous above, most noticeable on the head; superciliary region and ear-coverts washed with rufous, breast pale brown, not olive-grey (♀, Loka, 21. X. 95: P. & F. S.).

Measurements (4 specimens). Wing 81—86 mm; tail 62—65, tarsus c. 20; bill from nostril 9.5—10.

Distribution. South Celebes: Bonthain Mountains (Everett *2*, P. & F. Sarasin, Doherty *3*), "Macassar District" (Teijsmann *1*).

Like the northern form this seems to be an inhabitant of the mountains, and it is as yet definitely known only from the Peak of Bonthain and the highlands around it, where, as the Drs. Sarasins write, it "is one of the most plentiful birds; sings like a Blackcap".

The two type-specimens of this discovery of Teijsmann's are in the Leyden Museum. It is, as Mr. Büttikofer says, a southern representative of *P. sulfuriventer*. When the intermediate area has been zoologically explored it is likely that connecting links between the two forms will be supplied, which will render it advisable to take a broader view of the species and to treat the northern and southern forms as subspecies of it.

* 144. PACHYCEPHALA TEIJSMANNI Bütt.

Saleyer Thick-head.

Plate XVII.

Pachycephala teijsmanni *(1)* Büttik., Notes Leyden Mus. 1893, XV, 167; *(2)* id., Zool. Erg. Weber's Reise in Ost-Ind. 1893, III, 286; *(3)* Hart., Nov. Zool. 1896, 169.

Adult. "Similar to *P. orpheus* Jard. from Timor, with the exception of the ashy grey head and the much stronger bill".

"Entire crown, including forehead, nape, lores, sides of head and ear-coverts, uniform ashy-grey without any tinge of olive; mantle, back, rump, upper tail-coverts and tail above and below olive-green, the rump, upper tail-coverts and outer edge of tail-feathers strongly tinged with yellow; wings blackish, the primaries edged on the basal half with yellowish green, on the terminal half with pearly grey, the secondaries and upper wing-coverts more broadly edged with yellowish green, edge of wing yellow; chin and throat white; breast, flanks and abdomen pale fawn, the latter with a yellowish hue; under tail-coverts bright yellow; thighs yellowish green; under wing-coverts and inner edge of quills underneath pale fawn. Bill black, feet brown" (Büttikofer *1*).

Measurements. "Wing 71—73 mm, tail 60, culmen 17, tarsus 20" (id.).

Female. "Resembles the male, but the white of the throat does not extend so far down towards the breast; the top of the head is not dark slaty grey, but paler grey, the lores tinged with ochraceous, the ear-coverts pale fawn-colour with paler shafts. Wing 73 mm" (Hartert *3*).

Remarks. "In the fully adult male in fresh plumage the ear-coverts are darker than the crown, being almost black" (Hartert *3*).

"A very young male, just out of the nest, resembles the old female, but the breast and abdomen are white streaked with dark brown, the mantle washed with brown" (Hartert *3*).

Distribution. Saleyer Island (Weber *2*, Ever. *3*); ? Macassar District, Celebes (Teijsmann *1*).

Three specimens obtained by Teijsmann were indicated as having come from the District of Macassar, but it seems more probable that they were killed in Saleyer, an island which was visited by Teijsmann. Here a fourth specimen was subsequently obtained by Prof. Weber, and a series by Mr. Everett.

Mr. Büttikofer calls attention to the occurrence of the closely allied *P. orpheus* Jard. of the Timor-group in the same island, an occurrence so unexpected that it may awaken some doubt whether the two specimens determined as *P. orpheus* may not possibly be immature examples of *P. teijsmanni*.

145. PACHYCEPHALA ORPHEUS Jard.

Timorese Thick-head.

Pachycephala orpheus *(1)* Jard., Contr. Orn. 1849, 129, pl. 30 (♀); *(2)* Wall., P. Z. S. 1863, 486; *(3)* Finsch, Neu-Guinea 1865, 175; *(4)* Gray, HL. 1869, I, 389, Nr. 5912; *(5)* Gadow, Cat. B. VIII, 1883, 213; *(6)* Büttik., Notes Leyden Mus. 1891, XIII, 212; *(7)* id., Zool. Erg. Weber's Reise in Ost-Ind. 1893, III, 286; *(8)* Hart., Nov. Zool. 1896, 166, 181, 182.

a. **Hyloterpe orpheus** *(1)* Bp., Consp. 1850, I, 329; *(2)* Wald., Tr. Z. S. 1875, IX, 179; *(3)* Heine & Rchnw., Nomencl. Mus. Hein. 1890, 39.

Figure and description. Jardine *I*, Gadow *5*.

Adult. General colour above greenish brown, passing into dull yellow on the rump and upper tail-coverts; wing-coverts and quills umber-brown, externally edged with pale olive-brown; tail umber, strongly washed with yellow, somewhat darker than the upper tail-coverts; head dull ashy grey; lores, forehead and superciliary stripe

whitish grey; ear-coverts reddish brown; chin and throat white; breast pale fawn-buff, paler on the abdomen and flanks; under tail-coverts bright yellow; thighs pale brownish, terminal half yellow; under wing-coverts and axillaries whitish, tinged with pale fawn-colour; under surface of quills dusky brown, edged with whitish on the inner webs; bill dark umber-brown, feet grey or lead-colour. Culmen 15 mm; wing 72; tail 61; tarsus 20 (Gadow *5*).

Distribution. Timor (Wall. *5*, ten Kate *6*); Samao (Mus. Leyd. *7*); Saleyer (Weber *7*).

This species is included among the birds of the Celebes Province on the ground that two specimens were obtained by Weber in the island of Saleyer and sent to the Leyden Museum. Mr. Büttikofer remarks that the bill is stouter than in the typical *P. orpheus*, but at the same time thinner than in *P. teijsmanni* which has been found in the same island and which appears to be the nearest ally of the species. *P. teijsmanni* is described as having the whole head with forehead, lores and ear-coverts uniform ashy grey, while the head of *P. orpheus* is said to be olive-grey and, as Gadow adds, the lores, forehead and superciliary stripe whitish grey, the ear-coverts reddish brown. It may still be desirable to test the case to make sure that the Saleyer specimens are not the young of *P. teijsmanni*.

146. PACHYCEPHALA GRISEONOTA G. R. Gray.

Ashy Thick-head.

Pachycephala griseonota *(1)* Gray, P. Z. S. 1861, 429, 435; *(2)* Salvad., Orn. Pap. II, 1881, 229; *(3)* Gadow, Cat. B. VIII, 1883, 217; *(4)* Heine & Rchnw., Nomencl. Mus. Hein. 1890, 39; *(5)* Salvad., Orn. Pap., Agg. 1890, 106.

a. **Pachycephala rufescens** *(1)* Wall., P. Z. S. 1862, 335, 341; *(2)* Salvad., Ann. Mus. Civ. Gen. 1878, XII, 331.

b. **Pachycephala lineolata** *(1)* Wall. *a 1*; *(2)* Salvad. *a 2*, p. 332.

For further synonymy and references see Salvadori *2*.

Descriptions. Wallace *a 1*; Salvadori *2*; Gadow *3*.

Male. Above dusky cinereous, head purer cinereous; below rufescent; throat whitish; quills and rectrices dusky, margined with cinereous (Salvadori *2*). Bill and feet black; iris dark (Wallace *b 1*).

Female. Above cinereous, tinged with olive-green; beneath pale ochreous yellow, the feathers of the throat and breast with a median dusky stripe; lores light ash; chin nearly white; quills dusky, bordered with olivaceous; bill and feet blackish; iris dark (Wallace *a 1*).

Distribution. Sula Islands (Allen *a 1*, *b 1*, *3*); Buru (Wallace *a 1*, *b 1*, *3*, Rosenberg *3*); ? Ceram (Brit. Mus. *3*).

P. rufescens of Sula and Buru and *P. lineolata* of the same two localities were originally described by Wallace as distinct species, but Salvadori seems now to have satisfactorily proved that the differences in colorationare of a sexual character. Its nearest affinities seem to be with *P. cinerascens* Salvad. of Ternate, Tidore and Morty, in which similar differences between the males and females are pointed out (Orn. Pap. II, 228).

There is some uncertainty about the locality whence the type of *P. griseonota*, an immature male, came, for the label, as Count Salvadori points out, is marked "Ceram?" and, above this, "Mysol?". The locality Mysol is accepted without query by Gadow and by Heine & Reichenow for a specimen in the Heine Museum. For the present both islands should be regarded as doubtful, but we believe, with Salvadori, that Ceram will prove to be the correct habitat of the species.

147. PACHYCEPHALA CLIO Wall.

Sula Black-cowled Thick-head.

Pachycephala clio *(1)* Wall., P. Z. S. 1862, 335, 341; *(2)* id., P. Z. S. 1863, 30; *(3)* Finsch, Neu-Guinea 1865, 175; *(4)* Gray, HL. I, 1869, 388, Nr. 5881; *(5)* Salvad., Ann. Mus. Civ. Gen. 1876, VIII, 377; *(6)* id., ib. 1878, XII, 330; *(7)* Sharpe, Zool. Voy. Alert 1884, 16; *(8)* Salvad., Orn. Pap., Agg. 1890, 102; *(9)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 2, p. 16.

a. **Pachycephala macrorhyncha** pt. *(1)* Salvad., Orn. Pap. II, 1881, 218 (Buru and ? Sula).

b. **Pachycephala melanura** pt. *(1)* Gadow, Cat. B. VIII, 1883, 185.

"Kokijok", Peling and Banggai, Nat. Coll.

"Kokijak" (♀) Banggai, Nat. Coll.

Adult male. Head and face black, passing round the jugulum as a narrow collar; chin, throat and submalar region white; upper parts yellow-olive; tail and remiges black, the secondaries broadly bordered with the colour of the upper parts, the primaries with greyer olive; extreme tip of tail brown; under parts, a collar passing round the hind neck, and metacarpal edge gamboge-yellow; inner under wing-coverts whiter; remiges below dusky, whitish where they rest upon the body: bill black; legs and feet dark ([♀] ad. Peling Id. V.—VIII. 95: Nat. Coll. — C 14555).

Female. Above, including the tail, and the remiges externally olive-brown, remiges internally dusky; head above dark grey-olive, lores whiter, ear-coverts more as the back; chin and throat impure white; a faint brownish band across the breast; under parts rufescent-yellowish, clearing mesially into purer yellow; legs and feet brown, claws paler; bill blackish ([♀] Banggai Id. V.—VIII. 95: Nat. Coll. — C 14683).

Measurements. Wing (males) 90—93 mm, (females) ca. 85; tail ca. 71; tarsus ca. 21; bill from nostril ca. 11.

Distribution. Sula Islands — (Allen *1*), Sula Besi (Bernstein *b 1*); Peling and Banggai (Nat. Coll.); Buru (Wallace *1*, *2*, Bruijn *5*, *a 1*).

Mr. Wallace *(2)* remarks that his Buru specimens "have a more yellow tinge on the back, and the black pectoral band is generally broader than in those from Sula". In 1881 *(a 1)* Count Salvadori united the Buru bird with *P. macrorhyncha* Strickl. of Ceram and Amboina. In his valuable key *(7)* to the four closely allied forms of the group composed of *P. melanura*, *clio*, *macrorhyncha* and *obiensis* Dr. Sharpe has unfortunately neglected to define the geographical limits of the species; and, as Count Salvadori at the time of writing

had only a young male from Buru before him, Mr. Wallace's *(2)* geographical limitation should be accepted: namely *P. clio*, Sula and Buru (though it must still be ascertained whether they do not really differ); *P. macrorhyncha*, Amboina and Ceram. *P. obiensis* is from the Obi-group, and *P. melanura* from Australia, New Guinea and New Britain. Adults of the last species may be distinguished by their olive-yellow upper tail-coverts, black in the other three; while *P. clio* itself may be distinguished by having the black pectoral collar joined to the ear-coverts *(7)*.

P. everetti Hart. of Djampea differs in the male by its black wings, broader black jugular collar, with the yellow below it much darker and less pure; the female has much more grey in its plumage.

A specimen of *P. clio* in the British Museum from the Gould collection is labelled "Celebes". Dr. Sharpe *(7)* considers this to be erroneous.

* 148. PACHYCEPHALA EVERETTI Hart.

Djampea Black-cowled Thick-head.

Plate XVII.

Pachycephala everetti *(1)* Hartert, Nov. Zool. 1896, 170.

Adult male. Differs from the adult male of *S. clio* by having the wing-coverts and remiges black, a narrow edging of grey on the primaries only; the jugular collar broader, broadest mesially, the yellow below this darker, with a tinge of ochraceous in it; a band of yellow across the rump; the middles of the feathers of the upper parts black, seen to some extent (♂, Djampea Id., Dec. 1895: Everett — C 14866).

In some specimens, believed by Hartert to be very old individuals, the black in the feathers of the upper surface is absent *(1)*.

"Iris crimson-lake; bill jet-black; legs plumbeous or plumbeous blue-grey; claws darker grey or brown" (Ev.).

Female. Differs from the female of *P. clio* in having the head paler grey olive; the back and mantle olivaceous, washed with grey; the feathers of the rump terminally light yellowish, forming a band, below salmon-colour, washed with brown on the breast, whitish on throat, deep yellow on under tail-coverts (♀, Djampea, Dec. 1895: Ev. — C 14867).

Measurements. Wing 80 mm; tail 64—66; culmen 19 (bill from nostril 12); tarsus 23 (Hartert).

Distribution. Djampea Island between Flores and Celebes (Everett *1*).

This species was found by Mr. Everett on Djampea, where it is common. It seems to stand extremely near *P. fulvotincta* Wall. of Flores, the chief difference pointed out by Hartert being that the latter bird has not so much orange on the breast. Compared with *P. clio*, it might be described as a melanotic form. The difference between the two species is about as great as that seen in the Orioles, *O. formosus* of Sangi, and the melanotic *O. melanisticus* of Talaut; moreover the black of the head, the greenish yellow-olive of the upper parts, and the rich yellow of the under parts are curiously of the same tint in these two very different genera.

* 149. PACHYCEPHALA BONTHAINA M. & Wg.

Southern Fringilline Thick-head.

Plate XIX.

Pachycephala bonthaina *(1)* M. & Wg., Abh. Mus. Dresden 1896, Nr. 2, p. 10; *(2)* Hart., Nov. Zool. 1896, 149, 155; *(3)* id., ib. 1897, 158.

Descriptions. M. & Wg. *1*; Hartert *2*.

Adult male. Head greenish yellow-olive, brighter on the ear-coverts and superciliary region; lores duskier; neck, mantle, upper back, wings, tail, and body below brownish slate-grey, darker above, paler below, washed with olive on the wings and breast, more strongly on the chin and throat; lower back, rump, upper tail-coverts, sides, and flanks yellow-olive like the head, brighter on the flanks, washed with brownish ochraceous on the under tail-coverts; under wing-coverts and remiges where they rest upon the body pale cinnamon: "iris scarlet; bill black; feet blackish" — Doherty *2* (♂, type, Wawo Karaeng Mt., S. Cel., above 2000 m., 29. X. 95: Sarasin Coll.).

Female. Like the male, but the chin and throat olive-slaty, streaked with pale buff; some buff edgings to the feathers of the forehead: "iris cherry-red" (♀, co-type, Lompobatang Mt., c. 2400 m, 6. IX. 95: Sarasin Coll.).

Immature male. The whole upper side washed with olive, the whole under side striped with pale brownish buff, the head and neck olive-brown (Hartert *2*).

Measurements. Wing 82—86 mm; tail 65—68; tarsus 22—23; bill from nostril 8.

Distribution. Bonthain Mountains, S. Celebes (P. & F. Sarasin *1*, Everett *2*, Doherty *3*).

This bird is as yet known only from great elevations, 6000 ft. and upwards on the Peak of Bonthain and the adjacent heights. Apart from the next species, *P. bonensis* of the mountains of the Gorontalo Province, N. Celebes — with which it may ultimately prove to be identical, though more probably not so — it seems to have no near allies; its coloration is peculiar and its bill small, though *Pachycephaline* in structure. Its general appearance is Finch-like.

* 150. PACHYCEPHALA BONENSIS M. & Wg.

Northern Fringilline Thick-head.

Plate XVIII.

Pachycephala bonensis *(1)* M. & Wg., Abh. Mus. Dresden 1894, Nr. 4, p. 2; *(2)* iid., ib. 1896, Nr. 1, p. 11; *(3)* Hart., Nov. Zool. 1896, 155.

Young. Above greenish yellow-olive, including the wing-coverts and outer edges of the secondaries, those of the primaries greyer, passing into browner olive on mantle, neck and head; tail olive-brown; chin and throat cinnamon, with grey-brown middles to the feathers; breast grey-brown, washed with cinnamon on abdomen, passing into yellow-olive on sides, flanks and crissum, with an ochraceous tinge on the under tail-coverts; under wing-coverts cinnamon, a little paler on remiges where they lie upon the body, the latter elsewhere dusky: legs brown, claws paler; "iris brown" (♀?, type, Bone Mts. c. 1000 m, 15. Jan. 1894: Sarasin Coll.).

Measurements. Wing 81 mm; tail 63; tarsus 22; bill from nostril 7, culmen 14.

Distribution. Bone Mountains, North Celebes (P. & F. Sarasin).

The only specimen as yet known of this species was obtained by the Sarasins during their journey from Gorontalo up the valley of the Bone into the mountains where that river finds its source; it is unfortunately most likely a female and seems to be young, so that it is not possible to state with absolute certainly that the birds inhabiting the southern mountains, *P. bonthaina*, are distinct from it. It is improbable, however, that the wings would change colour much in adult birds, and they are dark greenish yellow-olive in *P. bonensis*, and dark slate-grey with a wash of olive in *P. bonthaina*. Other differences are: the chin and throat streaked with slaty brown, with broad cinnamon edges to the feathers in *P. bonensis*, with light buff edges in *P. bonthaina*; the mantle washed with the yellow-olive of the lower back in *P. bonensis*, but dark brownish slaty in *P. bonthaina*. But, as Mr. Hartert has shown, the young *P. bonthaina* has the whole upper surface washed with olive, and the head and neck olive-brown.

GENUS COLLURICINCLA Vig. Horsf.

Culmen about as long as the cranium, bill across the nostril narrower than high, nostril roundish, not ossified posteriorly — partially concealed by feathers and bristles; tail square; tarsus rather large, scutellated; second primary longer than the secondaries. Occurring in Australia; New Guinea: Sangi.

* 151. COLLURICINCLA SANGIRENSIS (Oust.).

Sangi Shrike-thrush.

a. **Pinarolestes sanghirensis** *(1)* Oust., Bull. Soc. Philom. Paris (7) V, 1881, 71; *(2)* Rchw. & Schalow, J. f. O. 1884, 400; *(3)* W. Blas., Ornis 1888, 584.

Descriptions. Oustalet *a 1*; Rchw. & Schalow *a 2*.

Male and female. Above olive-brown; wing-coverts and lower back reddish brown; tail-feathers above deep brown, below clearer brown; under-parts brownish, passing into greenish yellow at the flanks; bill (in dry skin) pale brown towards base of lower mandible, the rest black; feet blackish brown. Wing 98—100 mm; tail 82; bill 18—19 (Oust. *a 1*).

Distribution. Great Sangi — Petta (Mus. Paris *a 1*).

The two specimens, indicated as male and female, in the Paris Museum are found by Dr. Oustalet to have affinities with *Colluricincla megarhyncha* (Q. & G.) of New Guinea and some of the neighbouring islands, but still closer resemblance to *C. melanorhyncha* (Meyer) of Mysore. From the former, *C. sangirensis* differs in the colour and form of its bill, and seems to be a little larger than average specimens of that species. *C. melanorhyncha* is distinguishable from the Sangi form by its uniform black bill, paler feet, the green reflections of the upper surface most strongly pronounced upon the nape, the forehead streaked with yellowish, the external edgings of the quills yellowish red, rather than

red-ochre. The inner edgings of the quills in the Sangi bird incline to reddish white, the under tail-coverts tend to a saffron tint.

The genus *Colluricincla*, which Dr. Sharpe divides into *Colluricincla* and *Pinarolestes*, belongs to Papuasia, Australia, and the Fiji and Tonga Islands. Sangi forms an unexpected addition to its range, though its occurrence there is not more remarkable than its presence in Fiji and Tonga.

GENUS LANIUS L.

Bill strong, much deeper than broad across the nostril, the tomia furnished with a tooth and notch, the nostril small, roundish, ossified, partly hidden by projecting plumes and hairs from the forehead; the tail as long or longer than the wing, graduated; 3rd, 4th and 5th primaries the longest, the 1st about $^1/_2$ the length of the 2nd; tarsus about as long as the middle toe and claw, or a little longer, anteriorly scutellated; no brilliant colours in the plumage; young marked with cross bars, often seen also in the adult female. The genus inhabits Europe, Africa, Asia as far as Celebes, and North America; some species migratory.

152. LANIUS TIGRINUS Drapiez.

Thick-billed Shrike.

Lanius tigrinus[1]) *(1)* Drap., Dict. Class. Hist. Nat. XIII, 1828, 523; *(2)* Blyth, Cat. B. Mus. As. Soc. 1842, 152; *(3)* Jerd., Ibis 1872, 116; *(4)* Gadow, Cat. B. VIII, 1883, 289; *(5)* Büttik., Notes Leyd. Mus. 1887, IX, 53; *(6)* Everett, J. Str. Br. R. A. S. 1889, 121; *(7)* Oates, Faun. Brit. Ind. B. 1889, I, 470; *(8)* W. Blas., J. f. O. 1890, 139; *(8bis)* Hagen, T. Ned. Aard. Genoots. 1890, (2) VII, 148; *(9)* Styan, Ibis 1891, 348; *(10)* Hartert, Kat. Vg. Senckenb. Mus. 1891, 90; *(11)* De La Touche, Ibis 1892, 410; *(12)* Sharpe, Ibis 1894, 259; *(13)* Büttik., Notes Leyden Mus. 1896, XVIII, 183.

a. **Lanius ferox** *(1)* Drapiez, Dict. Class. H. N. 1818, 523 (= ♀ fide Bp.).

b. **Lanius magnirostris** *(1)* Less., Voy. de Bélanger 1834, II, 251; *(2)* id., Cpl. Buff. 1834, II, 415; *(III)* Wald., Ibis 1867, 220—223, pl. VI, fig. 1 (♂), fig. 2 (♀); *(4)* id., ib. 1869, 242; *(5)* Gray, HL. 1869, I, 393, Nr. 5972; *(6)* Blyth, Ibis 1870, 164; *(7)* Wald., Ibis 1871, 173; *(8)* Swinh., P. Z. S. 1871, 375; *(9)* Meyer, J. f. O. 1873, 405; *(10)* Swinh., Ibis 1875, 115; *(11)* David & Oust., Ois. Chine 1877, 97; *(12)* Hume & Dav., Str. F. 1878, VI, 203; *(13)* Hume, Str. F. 1879, VIII, 91; *(14)* Meyer, Ibis 1879, 129; *(15)* Salvad., Ann. Mus. Civ. Gen. 1879, XVI, 210; *(16)* Nichol., Ibis 1881, 150; *(17)* id., ib. 1883, 252; *(18)* W. Blas., Verh. z.-b. Ges. Wien 1883, 52; *(19)* id., J. f. O. 1883, 148; *(20)* Oates, B. Brit. Burmah 1883, I, 253; *(21)* Seeb., Ibis 1884, 37; *(22)* Tristr., t. c. 402; *(23)* Tristr., Cat. Coll. B. 1889, 194; *(24)* Seeb., B. Japan. Emp. 1890, 104; *(25)* Salvad., Ann. Mus. Civ. Gen. 1891, (2) XII, 57; *(26)* Campb., Ibis 1892, 238.

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[1]) Dr. Gadow *(4)* appears to us to be perfectly right in adopting this name. Lord Walden *(b III)*, who believed that the *L. tigrinus* and *ferox* of Drapiez could not be the same bird, did not make allowance for the stretching of a badly prepared skin, nor does he give the earliest date of Drapiez.

c. **Lanius strigatus** *(1)* Eyton, P. Z. S. 1839, 103.

d. **Enneoctonus crassirostris** "Kuhl" *(1)* Bp., Consp. 1850, I, 362; *(2)* Cab., Mus. Hein. I, 1851, 72 (ex "v. Hasselt").

e. **Otomela crassirostris** *(1)* Bp., Rev. Zool. 1853, 437.

f. **Enneoctonus tigrinus** *(1)* Horsf. & Moore, Cat. B. Mus. E. I. Co. 1854, I, 168; *(2)* Tacz., Fauna Orn. Sib. Orient. 1891, I, 494.

g. **Lanius phoenicurus** *(1)* Schrenck (nec Pall.), Reise Amurl. 1860, I, 384 — fide Wald. *b 4.*

h. **Lanius crassirostris** *(1)* Pelz., Reise der Novara, Zool. 1865, 84.

i. **Lanius waldeni** *(1)* Swinh., P. Z. S. 1870, 131, pl. XI.

j. **Lanius incertus** *(1)* Swinh., P. Z. S. 1871, 376; *(2)* id., Ibis 1875, 115.

k. **Otomela magnirostris** *(1)* Schalow. J. f. O. 1875, 142; *(2)* Tacz., J. f. O. 1876, 197; *(3)* Schalow, t. c. 214; *(4)* Tacz., Bull. S. Z. France 1876, 167; *(5)* id., ib. 1880, 137; *(6)* id., J. f. O. 1881, 182.

l. **Enneoctonus magnirostris** *(1)* Heine & Rchw., Nomencl. Mus. Hein. 1890, 43.

m. **Lanius** sp. *(1)* Salvad., Cat. Ucc. Borneo 1874, 159 (Borneo — Mus. Leyd.; evidently the specimen mentioned by Büttikofer *5*).

Figures and descriptions. Walden *b III*; Swinhoe *i I*; David & Oustalet *b 11*; Hume & Davison *b 12*; Oates *b 20*, 7; Gadow *4*; Taczanowski *f 2*.

Adult male. Head above, neck and upper mantle grey; a band extending narrowly across forehead at base of bill, lores, suborbital region, ear-coverts and a narrow mark above eye black; back, wing-coverts, rump and upper tail-coverts and inner quills russet, becoming brighter towards the tail-coverts, and rather closely barred with black, this colour running submarginally along the inner quills; the other quills dusky brown, externally russet; tail brownish hazel, showing nearly obsolete traces of close bars, outer feathers narrowly tipped with white and having a subterminal brown line; below white, the sides and flanks closely marked with wavy bars of blackish (Banka, 2. Jan. 1861, v. d. Bossche: C 10565). Iris dark brown; feet pale blue; bill pale blue, black at the tip (H. O. Forbes *b 16*).

The amount of barring on the under surface seems to vary. Hume *(b 12)* describes an "old adult" from Tenasserim with the entire under parts white, except a few feathers on the posterior flanks which are faintly rufescent and barred.

Female. Resembles the male (Swinhoe *b 8*, Schalow *k 1*, D. & O. *b 11*, Oates *b 20*), but the perfect plumage is probably assumed more slowly. Bill deep indigo-grey; feet and toes lavender-grey, dingy on soles (Swinhoe *b 10*).

Young. Differs from the adult in having the head above russet, the shafts and adjacent portion of webs whitish, giving a striate-speckled appearance, traces of dark subterminal bars to the feathers; nasal plumes black; no black band on the sides of the head, lores whitish, ear-coverts whitish with dusky bars (Manado, Celebes, ♂, April 1871, Meyer; C 243). Bill bluish flesh-colour on basal portion, on apical portion deep brown. Legs and toes violet-leaden with yellowish grey soles and brownish nails (Swinh. *b 10*).

Measurements. Wing 85; tail 80; bill from nostril 12; tarsus 22 mm.

Eggs (Ussuri-land). Like those of *L. collurio* and *L. phoenicurus (cristatus)*, and correspondingly variable, i. e. the spots on one are grey, on another olive, on another again red, similarly arranged, but smaller. As is the case with the species mentioned, the eggs of the same sitting are similar in colour. Measurements (3 clutches — 13 eggs: 21.2—23.3 × 16.5—17.4 mm (Taczanowski *k 2*).

Nest. The above nests were fastened among the twigs of low bush-growths, about two feet from the ground; somewhat closely and thickly built of stiff plant-stalks, one almost exclusively of heath-twigs, covered thickly with dry flowers, giving the nest a very

pleasing exterior; neatly lined with finer grasses and stalks. In shape a half-globe, with tolerably thick walls. Diam. 14, internal diam. 7, depth 5 cm (Tacz. *k 2*).

Nests in pine-woods in the province of Kiangsi (David *b 11*).

Breeding season. Spring and early summer. Known as a breeding species from Ussuri-land to the Yang tse (Tacz. *k 2*, *k 6*, Styan *9*, Swinh. *i I*).

Distribution. Amurland (Schrenck *g 1*); Ussuri-land (Dybowski & Godlewski *k 2*); Askold Id. (Dybowski *k 6*); Corea (Campbell *b 26*); Japan (Pryer & Jouy *b 24*); China (Swinhoe *i I*, *b 8*, *b 10*, David *b 11*, Styan *9*, etc.); Tenasserim (Davison *b 12*, *b 20*); Malay Peninsula (Davison *b 12*, Cantor *4*, Wallace *4*); Singapore (Mus. Leyd. *5*); Sumatra (Wallace *b III*, *4*, Beccari *b 15*, Modigl. *b 25*); Nias (Kannegieter *13*); Java (Kuhl, Blume and Junghuhn *5*, H. O. Forbes *b 16*); Banka (Mus. Leyd. *5*); Borneo (S. Müll. *5*, Grabowski *b 18*, etc. *6*); Sooloo Is. (Platen *8*, *12*); N. Celebes — Manado (Meyer *b 9*, *b 14*, *b 19*).

The Thick-billed Shrike of Eastern Asia is included in the Celebes list on account of a single young individual killed by Meyer near Manado in April, 1871. Celebes is now known to possess two Shrikes, this and *L. lucionensis*, both of which seem to be simply winter migrants from the north and west. Mr. Büttikofer *(5)* suggests the possible identity of the Dresden specimen with *L. lucionensis*; this is not the case, nor indeed is there anything remarkable in its occurrence in Celebes, which is reached by many other East-Asiatic migratory birds.

L. tigrinus is, as Seebohm remarks, a very rare bird in Japan *(b 24)*; Campbell considered it rare in Corea *(b 26)*, but Dybowski seems to have found it a not uncommon bird further north in Ussuri-land; in the neighbourhood of Pekin, according to David, it comes only in summer and always in small numbers, but it is not rare in the central provinces and particularly in Kiangsi, "where it breeds and where I have often found it in the pine woods which cover this province". At Kiukiang on the Yangtse about 30° N., Mr. Styan *(9)* observed that it "arrives in fair numbers in May, and remains to breed. The young are hatched out in July". It appears on the whole that the central provinces of China form the main breeding-grounds of the species. Formosa, the natural half-way house for migrants to the Philippines, has not yet, so far as we are aware, furnished specimens; in the Philippines, including Palawan, it is likewise as yet unknown. What is yet known about the bird in other parts tends to prove that it is a fairly plentiful winter visitor to Malacca and Sumatra, occurs in somewhat smaller numbers in Java, is rare in Borneo, and specially rare in Celebes. It seems that this species avoids as much as possible migration across seas, but travels from China over S. E. Asia and down the Malay Peninsula into Sumatra, Java, and in smaller numbers, Borneo, now and then reaching Celebes and no doubt some of the other neighbouring islands. *L. lucionensis* in its migrations offers some curious points in contrast.

There is no evidence to show that *L. tigrinus* breeds in the East Indies, on the other hand the recorded dates of specimens tend to prove that it is there only in the northern winter, when it is absent in China. These dates relate

unfortunately to only a dozen specimens ranging from Sept. 19th to April (see Salvadori *b* ***15***, *b* ***25***, Tristram *b* ***23***, W. Blasius *b* ***18***, Meyer *b* ***14***), but Prof. W. Blasius's Sooloo specimen was included in a collection formed by Dr. Platen "in summer", 1887 *(8)*. *L. tigrinus* is easily distinguishable from *L. lucionensis* by its barred back and grey head and mantle, the latter species being above uniform broccoli-brown, greyer on the head. Dr. Gadow places *tigrinus* next to *L. collurioides* Less. of Burmah, from which it may likewise be distinguished by its barred back. This character in the adult male makes it a well-marked species among the red-tailed Shrikes. This peculiarity must be a character of very long standing, inasmuch as most — if not all — Shrikes are more or less barred above when young.

The genus *Lanius* is absent in the Australian Region, though occurring in Europe, Africa, Asia and N. America, "extending into the northern parts of the Neotropical Region" (Gadow).

153. LANIUS LUCIONENSIS L.

Chinese Red-tailed Shrike.

Lanius lucionensis [Briss., Orn. 1760, II, 169, pl. XVIII, fig. 1 — Lucon]; *(1)* Linn., S. N. 1766, I, 135; *(2)* Swinh., Ibis 1860, 59; *(3)* id., ib. 1861, 43, 255, 340; *(4)* id., ib. 1863, 272; *(4bis)* id., P. Z. S. 1863, 286; *(4ter)* id., Ibis 1866, 295, 394; *(5)* Martens, J. f. O. 1866, 12; *(6)* Wall, Ibis 1867, 215; *(7)* Gray, HL. I, 1869, 393, Nr, 5970; *(8)* Swinh., Ibis 1870, 241; *(8bis)* id., P. Z. S. 1870, 428; *(9)* id., P. Z. S. 1871, 376; *(10)* Wald., Ibis 1871, 173; *(11)* Ball, Str. F. 1873, I, 65; *(12)* Hume, t. c.. 434; *(13)* Wald., Ibis 1873, 309; *(14)* Hume, Str. F. 1874, II, 199; *(15)* Swinh., Ibis 1875, 115; *(16)* Wald., Ibis 1875, 116; *(XVII)* id., Tr. Z. S. 1875, IX, 171, pl. XXIX, fig. 1; *(18)* Sharpe, Ibis 1876, 43; *(18bis)* Hume, Str. F. 1876, IV, 393; *(19)* David & Oust., Ois. Chine 1877, 99; *(20)* Wald., P. Z. S. 1877, 536, 544, 692, 759; *(21)* Hume & Davis., Str. F. 1878, VI, 205; *(22)* Wald., P. Z. S. 1878, 342, 380, 709, 947; *(23)* Sharpe, Ibis 1879, 259; *(24)* id., P. Z. S. 1879, 341; *(25)* id., Tr. Z. S. 1879, (2) I, 323; *(26)* Hume, Str. F. 1878, VIII, 57, 91; *(27)* Legge, B. Ceylon 1880, 378; *(28)* Wdl. Ramsay, Tweedd. Works 1881, 656; *(29)* Gadow, Cat. B. VIII, 1883, 274; *(30)* Oates, B. Brit. Burmah 1883, I, 251; *(30bis)* W. Blas., "Braunschweig. Anz." 1886, 3. März; *(31)* Styan, Ibis 1887, 225; *(32)* Büttik., Notes Leyd. Mus. 1887, 55; *(33)* Sharpe, Ibis 1888, 198; *(34)* W. Blas., Ornis 1888, 311; *(35)* Oates, Fauna Br. Ind. 1889, I, 469; *(36)* Sharpe, Ibis 1889, 419; *(37)* Everett, J. Str. Br. R. A. S. 1889, 121; *(38)* Tristr., Cat. Coll. B. 1889, 193; *(39)* Steere, List Coll. B. Philipp. 1890, 14; *(40)* Seeb., B. Japan. Emp. 1890, 105; *(41)* W. Blas., J. f. O. 1890, 145; *(42)* Sharpe, Ibis 1890, 279; *(43)* Styan, Ibis 1891, 322, 348; *(44)* Vorderm., N. T. Ned. Ind. 1891, 228; *(45)* Campb., Ibis 1892, 239; *(46)* Hose, Ibis 1893, 393; *(47)* Büttik., Zool. Erg. Weber's Reise Ost-Ind. 1893, III, 299; *(48)* Bourns & Worces., B. Menage Exped. 1894, 39; *(49)* Grant, Ibis 1895, 24, 254; *(50)* De La Touche, t. c. 334; *(51)* Vorderm., N. T. Ned. Ind. 1895, 320; *(52)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 10; *(53)* Grant, Ibis 1896, 119, 550.

a. **Lanius phoenicurus** *(1)* Meyen (nec Pall.), Nov. Acta Acad. Caesar. Leopold. 1834, XVI,

74 (fide Schalow *g 1*); *(2)* id., Reise um die Erde 1835, II, 195; *(3)* Finsch & Conrad, Verh. z.-b. Ges. Wien 1873 (?).

b. **Enneoctonus lucionensis** *(1)* Gray, Gen. B. I, 1846, 291.

c. **Enneoctonus schwaneri**[1]) *(1)* Bp., Consp. 1850, I, 363.

d. **Otomela schwaneri** *(1)* Bp., Rev. Zool. 1853, 437.

e. **Lanius jeracopsis** *(1)* de Fil., Mus. Mediol. p. 31; *(2)* Bp., Rev. Zool. 1853, 437, note; *(3)* Salvad., Atti Ac. Sc. Tor. 1868, 272.

f. **Lanius schwaneri** *(1)* Pelz., Novara Reis. Vög. 1865, 48, 161; *(2)* Wald., Ibis 1867, 223; *(3)* Gray, HL. 1869, I, 393, Nr. 5974; *(4)* Salvad., Cat. Ucc. Borneo 1874, 159.

g. **Otomela lucionensis** *(1)* Schalow, J. f. O. 1875, 136; *(2)* id., ib. 1876, 214; *(3)* Tacz., Bull. S. Z. France 1879, 137; *(4)* id., J. f. O. 1881, 182; *(5)* id., O. Sib. Or. 1891, I, 502.

h. **Lanius luzoniensis** *(1)* Wald., P. Z. S. 1878, 614.

j. **Lanius luzonensis**[2]) *(1)* Whitehead, Ibis 1890, 47; *(2)* Hartert, J. f. O. 1891, 204; *(3)* M. & Wg., J. f. O. 1894, 244.

"Burong furofuro", Manado tua Id., Nat. Coll.

"Ainaürida marero" and **"Toreng penga"**, Talaut, Nat. Coll.

Some additional references cf. Wallace *6*.

Figure and descriptions. Walden *XVII*; Hume *14*; Schalow *g 1*; David & Oust. *19*; Legge *27*; Gadow *29*; Oates *30*, *35*; Vorderman *44*; Tacz. *g 5*.

Adult male (autumn). Above broccoli-brown, washed with grey on head and neck, with cinnamon on rump and upper tail-coverts; tail above brown with almost imperceptible traces of small close bars; wings dusky, the wing-coverts edged with the colour of the back, but paler, the secondaries with whitish; forehead whitish grey; a long superciliary stripe whitish; lores, subocular region and ear-coverts blackish; under parts buffy white, washed with rufous buff on breast, sides, flanks and under tail-coverts, darkest on the sides and flanks; under wing-coverts and inner edges of quills almost pure white (Bohol, Philippines, ♂, Oct. 1877, Everett — C 5406).

Iris brown; bill horny brown, edged with whitish, lower mandible bluish or fleshy white, terminal third horny brown; legs and feet dull leaden blue, dull bluish, or even greenish horny (Hume *14*).

Adult female (winter). Without the dark loral spot of the male, the under parts paler with faint dark cross-vermiculations on sides of neck, flanks and upper tail-coverts (Gadow *29*).

In summer according to Dr. Gadow, the birds are less tinged with grey above, and the female has the lores and ear-coverts browner than the male.

Young. Above rufous brown, crossed with faint dark vermiculations; ear-coverts and a small spot in front of the eye dark brown; under-parts with crescentic markings of dark brown on sides of neck, chest, flanks, vent and under tail-coverts (ex Legge, Gadow).

Colonel Legge *(27)* believes that the bars on the under surface do not vanish for several years. In the male this disappearance seems to take place more quickly, for Dr. Gadow shows that all the examples without cross-bars in the British Museum — 12 in number — are males. As in the case of *Lanius tigrinus*, it is probable that only old females, if any, correspond perfectly with the adult male. A specimen

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[1]) "The specimen from Borneo, collected by Schwaner and called *Enneoctonus schwaneri* by Bonaparte is a true *L. lucionensis*. The white superciliary streak is by no means absent, as Bonaparte says in his short diagnosis, but merely hidden by the somewhat overhanging feathers of the crown" (Büttik. *32*).

[2]) The spelling *luzonensis* is the right one, but as naturalists would perhaps not recognize *lucionensis* and *luzonensis* as identical, we retain the wrong spelling of Brisson.

from Tomohon, N. Celebes, marked ♀ in the Sarasin Collection is entirely without bars below.

Measurements (6 adults from the Philippines, Labuan 1, Talaut 2, N. Celebes 3, Manado tua 1). Wing 87—92 mm, tail 86—88; bill from nostril 10.5—12; tarsus 25.

Nest and eggs. We have not found any notes on the nidification of this species.

Distribution. Askold Id. off the coast of Russian Manchuria (Jankowski *g 3*, *g 4*); Corea (Campbell *45*); China (Swinh. *2*, *15*, David *19*, etc.); Loochoo Is. (Pryer *40*); Formosa (Swinh. *4*, *4ter*, *8bis*); Hainan — seen only? (Swinh. *8*); Philippines — Luzon, Panay, Cebu, Panaon, Leyte, Bohol, Negros, Guimaras, Mindoro, Basilan, Mindanao, Palawan (Jagor *5*, Meyer and Everett *28*, Schmacker *j 2*, Platen *41*); Talaut — Kabruang and Karkellang (Nat. Coll. in Dresden Mus.); Sangi (Hoedt *32*); Manado tua off N. Celebes (Nat. Coll. in Dresd. Mus.); Minahassa, N. Celebes (Platen *30bis*, v. Duivenbode *32*, P. & F. Sarasin, Nat. Coll.); Borneo (Everett, etc. *37*); Halmahera (fide Schalow *g 1*); Flores (Weber *47*); Sumatra (Vorderman *44*); Singapore (Hume *26*); Malay Peninsula (Hume *26*, Oates *35*); South Tenasserim (Davison *21*) and Mergui Is. (Oates *35*); Andamans (W. Rams. *13*, Dav. *14*); Nicobars (Dav. *14*); Ceylon (Hume *12*, *27*); South India — Travancore (Hume *18bis*).

The northernmost bounds of the range of this Shrike are not yet satisfactorily known. In Corea, where *L. tigrinus* is rare after Mr. Campbell's experience, *L. lucionensis* is very common in summer; at Pekin David met with it in spring and autumn during its passage to and from the Philippines and some country further north. Further south in China Mr. De La Touche observes that it "arrives towards the end of August and is common throughout September and October. It occurs during the winter; for I shot one on the 21st January" *(31)*. "In spring and fall", says Swinhoe *(4)* "it abounds at Amoy for a few days, and then disappears, on its vernal migration into the interior and North of China; and in autumn across the sea to the Philippines, where it hibernates. In its line of migration it touches S. W. Formosa, and there we had its company for a few days in the early part of September". Later *(4ter)* Mr. Swinhoe ascertained that it also passed the winter in Formosa. Rather more north in China, in the lower Yangtse Basin Mr. Styan *(43)* obtained very young ones in July, "which, there is little doubt, were bred locally. In August immature birds are very plentiful". Nevertheless, its main breeding-grounds would seem to be northernmost China, Corea and Manchuria; but, as noticed already, we have been unable to find any record of its nidification. Glancing south again, Swinhoe *(8bis)* notices a specimen which flew on board ship off Video Island near Shanghai on 15th May; a specimen crossing the sea during the autumn migration in September came on F. J. F. Meyen's ship in latit. 14° N. on the passage across the China Sea from Macao to Luzon *(a 1, a 2)*; a third, which we think may safely be identified with this species was taken at sea near Luzon by Capt. Conrad *(a 3)*. In the Philippines it seems to be common during the winter months and has been recorded from nearly all the chief islands. Two specimens obtained by our native hunters in Talaut are dated 13th November, 1893, and autumn, 1896; another from Manado tua, 15th April.

The Sarasins' example from North Celebes is dated 13. April, 1894; another from there in the Dresden Museum, 21. Febr., 1894. In Palawan Mr. John Whitehead *(j 1)* remarks that it is "a winter visitor arriving about 25th Sept."; similarly in West Borneo (Mt. Dulit) Mr. Hose *(46)* writes that it is "a monsoon visitor, and is found all through the low country, where it is by no means rare". Prof. Weber obtained a specimen even in Flores *(47)*, but we have come across no notice of its occurrence in Java, though Mr. Vorderman *(51)* has recorded it from Noordwachter Island, and his *(44)* specimen is the only one we have seen recorded from Sumatra. Mr. Hume notices several points where it has been killed in the Western Malay Peninsula, one of its winter quarters, according to Mr. Oates; but in Tenasserim Hume and Davison considered it a rare straggler to the southermost extremity only of the province. In Camorta, Nicobars, Davison shot one specimen, but in the Andamans it has been killed from December to October *(14)* and Hume remarks that it appears to be a permanent resident in those islands, though we should think with Legge that the birds which remain there during the breeding season are immature. Ceylon and South India seem to be reached only by casual wanderers; there seems to be no reason to doubt the correctness of Mr. Hume's determination of the two specimens known, one from each locality, though the author himself suggests the possibility of their belonging to a distinct race.

To recapitulate, the bird is known as a summer visitor to Corea, it passes by Pekin on migration, it seems, however, to breed in Central China further south; South China and Formosa it passes through in migration and some individuals pass the winter there; three specimens taken at sea — one off Shanghai, one in the S. China Sea and the third off Luzon — are mentioned; examples from the Philippines show that it is a plentiful winter visitor there, and observers in Palawan and W. Borneo note its arrival in September or with the monsoon, i. e. the N. E. trades, which begin to be felt in the East Indies north of the equator about September. Celebes, Halmahera and Flores on the east, and Tenasserim, Ceylon and South India on the west seem to mark the limits of its migration. Between Flores and Sumatra it seems to be very rare, but in Malacca and the Andamans it is sufficiently common again. The main autumn route of the species from S. China and Formosa is, therefore, across the China Sea to the Philippines and Borneo, as Swinhoe believed; at the same time it looks as if a certain number of individuals pursues another way into and over Siam to Malacca and the Andamans. The scarcity or absence of this species in Java and Sumatra is noteworthy, but Borneo would intercept migrants from the north.

The migration of *Lanius tigrinus* affords an instructive contrast to that of *L. lucionensis*. The northern range of the two species is very similar, but, as has been shown, *L. tigrinus* is not yet known from Formosa and the Philippines where *L. lucionensis* arrives in plenty in the autumn, but it is fairly common in

Sumatra and Java where *L. lucionensis* is scarce or even, as regards the latter locality, unknown. While *L. tigrinus* seems to travel over the mainland of S. E. Asia down the Malay Peninsula to the Great Sunda Islands, *L. lucionensis* like most other migrants crosses the sea to the Philippines and elsewhere. A somewhat similar case seems to be afforded by the two Hawks *Butastur liventer* and *indicus*, though more evidence in the case of *B. liventer* is wanting.

Swinhoe remarks upon the chattering cry and skulking habits of *L. lucionensis:* "It possesses a melodious song of no mean capacity, but it is generally uttered in a subdued tone. It feeds on large insects, especially *Libellulae*, but oftener, I think, on small birds, more particularly of the *Phylloscopus* group" *(4)*. Abbé David says that the Pekinese use it in hawking small birds, and greatly appreciate it for its sweet and melodious song. In the Andamans Davison found it a very silent bird, keeping to gardens and the cleared parts on the settlements; few birds sing, however, save in the season of courtship and honeymoon. It would appear, therefore, from this also that the bird does not breed in the Andamans.

Lanius erythronotus Vig., distinguished by its smoke-grey head and back, is nearly related to it.

FAMILY CAMPOPHAGIDAE.

These birds vary in size from the dimensions of a Sparrow to those of a Jackdaw, and are best characterized by the plumage of the rump, which is very thick and close, with the shafts of the feathers thickened and stiff, much as in many Cuckoos and Pigeons. The bill is moderate, denticulated, sometimes very strong, rictal bristles few and not conspicuous; the nostril often hidden by the frontal plumes and scanty small bristles; the wing is rather long, the secondaries about $^2/_3$ to $^3/_4$ of its length, the second primary longer than the secondaries, the first about half the length of the second; the tail somewhat long, occasionally exceeding the wing-length; the tarsus short, about the length of the culmen, more or less.

The family is found in the Australian, Oriental, and Ethiopian Regions.

Among the *Campophagidae*, the genus *Graucalus*, under which name we include the genus *Artamides* of some authors, is found in the Oriental Region, Papuasia, Australia, Madagascar and Africa. As regards plumage the four species of the Celebesian area are among the more highly specialized, and show on the whole stronger affinities with Papuasia than with the Oriental Region. *Edoliisoma* ranges from Australia to the Philippines and Uap in the Carolines. The Celebesian forms appear to have very likely reached the Province by flight from the west. Of the two species of *Lalage* occurring in Celebes, one, *L. leucopygialis*, we take for an advanced form of *L. terat* of the Oriental Region; the other, *L. timorensis*, seems to have reached the island recently from the Lesser Sunda Group. The

Campophagidae appear to have been long settled in the Indo-Australian area, as shown by the barred plumage of certain species of *Graucalus* which are found in both quarters. The young of the more highly specialized *G. leucopygius* reverts to this barred type of dress. *G. bicolor* and *G. temmincki* are well differentiated and, therefore, perhaps rather ancient insular forms. In any case these three forms must be regarded as older inhabitants of Celebes than *Lalage leucopygialis*.

GENUS GRAUCALUS Cuv.

A genus containing most of the larger members of the family, from a Thrush to a Jackdaw in size, the colours plain, grey, black, white, in one species blue, the sexes usually (if not always) somewhat different in coloration. The wing is long, 6—8 times the length of the tarsus, the 3rd and 4th quills the longest; the tarsus anteriorly scutellated; the bill rather large and strong, the culmen about as long as the cranium, the nostril round or round oval, covered by the projecting feathers and scanty bristles of the forehead.

The genus is found in the Australian, Ethiopian, and Indian Regions.

* 154. GRAUCALUS BICOLOR (Temm.).

Great Black-and-white Cuckoo-shrike.

Plate XX.

a. **Ceblepyris bicolor** *(1)* Temm., Pl. Col. 1824, pl. 278 (Sumatra!); *(2)* Less., Tr. d'Orn. 1831, 369; *(3)* S. Müll., Verh. Natuurk. Comm. 1839—43, 191; *(4)* Schl., Handl. Dierk. 1857, 289.

b. **Campephaga bicolor** *(1)* Gray, Gen. B. I, 1846, 283, Nr. 25; *(2)* id., P. Z. S. 1860, 354 (Banda!); *(3)* Finsch, Neu Guinea 1866, 172; *(4)* Gray, HL. 1869, I, 337; *(5)* Rosenb., Malay. Archip. 1878, 273.

Graucalus bicolor *(1)* Bp., Consp. 1850, I, 354; *(2)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 2, p. 14.

c. **Artamides bicolor** *(1)* Hartl., J. f. O. 1865, 171; *(2)* Wald., Tr. Z. S. 1872, VIII, 70; *(3)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 658; *(4)* Brügg., Abh. Ver. Bremen 1876, V, 72; *(5)* Sharpe, Mitth. Mus. Dresden 1878, III, 363; *(6)* id., Cat. B. 1879, IV, 17; *(7)* Meyer, Ibis 1879, 130, 146; *(8)* Salvad., Orn. Pap. 1881, II, 166; *(9)* W. Blas., J. f. O. 1883, 137; *(10)* id., Ztschr. ges. Orn. 1886, 116; *(11)* Vorderman, Nat. Tdschr. Ned. Ind. 1889, XLIX, 398; *(12)* Heine & Rchw., Nomencl. Mus. Hein. 1890, 68; *(13)* Hartert, Kat. Senckenb. Mus. 1891, 91; *(14)* id., Nov. Zool. 1897, 162.

"Maspas werreng intalung", Minahassa, or **"Maspas utang"**, Banka and Mantehage, Nat. Coll.
"Merapati daka daka", Tonkean, E. Celebes, Nat. Coll.

Figure and descriptions. Temminck *a I*; S. Müller *a 3*; Hartlaub *c 1*; Sharpe *c 6*.

Adult male. Above glossy black; lower back, rump, upper tail-coverts and bases of the tail-feathers where they are covered by the upper tail-coverts pure white; sides of head black, like the upper surface; entire under parts white; under wing-coverts white, marked with black near the metacarpal edge;

quills below greyish black, becoming pure white on the inner webs where they rest upon the sides of the body; tail below black, the concealed bases of the feathers white (near Manado [♂], Aug.—Sept. 1892: Nat. Coll. — C 10885; Rurukan, ♂, 15. VIII. 84: Platen in Mus. Nehrkorn — Nr. 935). "Iris dark umber; feet black; bill pale blue, commissure paler" (Doherty *c 14*).

Adult female. Above slate-grey with a slight olive tinge, shafts of the feathers blackish; lower back, rump, upper tail-coverts and concealed bases of tail-feathers white; wings and tail black, the wing-coverts bordered with the grey of the upper surface; lores blackish; sides of head, chin, throat and chest uniform with the grey upper surface, but paler, passing into pure white on lower breast, and remaining under parts; wings and tail below as in the male (near Tondano [♀], Aug.—Sept. 1892: Nat. Coll. — C 10807; Minahassa, ♀, 8. V. 86: Platen in Mus. Nehrk. — Nr. 1275). "Iris dark umber; feet blackish; bill pale blue, commissure darker" (Doherty *c 14*).

Immature male. The black parts of the plumage of the adult male replaced by dark slaty, except the wings and tail which are black, but the latter tipped with cinnamon white, the inner quills broadly bordered with white, the longer ones edged with cinnamon; the rest as in the adult (Mantehage [♂], 23. IV. 93: Nat. Coll. — C 12154).

Immature [female?]. Upper surface like that of the adult female, but the inner quills bordered with white; entire under surface, including chin, throat and breast, white as in the adult male (near Tondano [♀], Aug.—Sept. 1892: Nat. Coll. — C 10805).

Measurements (7 adults, ♂ and ♀). Wing 174—180 mm; tail 127—140; tarsus 23—25 ca.; bill from nostril (5 examples) 20.5—22.5. (3 immature): wing 164—169; tail 128—136; tarsus 24 ca.; bill fr. nostr. 20—21.

Breeding habits. Unknown.

Distribution. Celebes and the islands off the coast: Minahassa (Wallace *c 6*, Riedel *c 9*, etc.); Gorontalo Distr. (Meyer *c 7*); Banka Id., and Mantehage Id. (Nat. Coll. in Dresden Mus.); Togian Islands (Meyer *c 7*); E. Celebes (Nat. Coll.); Kandari, S. E. Celebes (Beccari *c 3*); Tawaya, W. Celebes (Doherty *c 14*).

This *Campophaga* — or Cuckoo-shrike, as Indian naturalists term these birds — is a very distinct species and was treated by Dr. Hartlaub as the only species representing his genus *Artamides*. Dr. Sharpe in the Catalogue of Birds, vol. IV, includes 15 more species under this generic name and others have been added since; 18 other species, to which a number of additions have since been made, are put in the genus *Graucalus*. Like Salvadori and others we prefer to keep them all in the genus *Graucalus*; the character by which Dr. Sharpe distinguishes his *Artamides* — a somewhat longer bill — enforces an unnatural division, species being found in the genus *Artamides* whose nearer allies are removed to the genus *Graucalus*. Nor does *Graucalus bicolor* seem worthy of generic separation. The adult male differs from all the other species of *Graucalus* in being black above (except on lower back and upper tail-coverts), but one sometimes has to look twice to distinguish the female from the female of *Graucalus leucopygius* of Celebes. The larger size and much larger bill and a white bases to the tail-feathers of *G. bicolor* serve to distinguish it.

The bird in both sexes corresponds rather well with the coloration of the sexes of *Lalage leucopygialis*.

The plumage of *G. bicolor* appears to present another remarkable example (see also *Loriculus*, *Hierococcyx crassirostris*, *Coracias* etc.) of the influence of light on the coloration. Seen from above with its wings naturally folded the male is black, the female slate-grey, below both are white, the female having also the throat and chest slate-grey as above. The lower back, rump and upper tail-coverts, concealed by the wings, are white like the under surface. No stress would be laid upon this, were it not that the black tail-feathers are also white where they are hidden by the tail-coverts. Further, the wings below, where they rest upon the sides of the body and rump, are white, while the free, more exposed ends of the quills are blackish grey.

In *Graucalus leucopygius*, it may however be added, the lining of the quills, but not the basal part of the tail-feathers, is white; in *Artamus* both are white, though expressed less well than in *G. bicolor*. Perhaps others will try an explanation of this obvious disposition of pigment.

The bird seems to moult in August—September, no doubt after breeding, but an immature bird killed in May is also moulting.

* 155. GRAUCALUS LEUCOPYGIUS Bp.

Celebesian Grey Cuckoo-shrike.

Plate XXI.

Graucalus leucopygius *(1)* Bp., Consp. 1850, I, 354; *(2)* Hartl., J. f. O. 1864, 443; *(3)* Wald., Tr. Z. S. 1872, VIII, 68; *(4)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 657; *(5)* Brüggem., Abh. Ver. Bremen 1876, V, 71; *(6)* Lenz, J. f. O. 1877, 374; *(7)* Sharpe, Mitth. Z. Mus. Dresden 1878, III, 365; *(8)* id., Cat. B. IV, 1879, 33; *(9)* Meyer, Ibis 1879, 129, 146; *(10)* W. Blas., J. f. O. 1883, 137; *(11)* Meyer, Isis, Dresden 1884, 6; *(12)* W. Blas., Ztschr. ges. Orn. 1885, 280; *(13)* Guillem., P. Z. S. 1885, 553; *(14)* W. Blas., Ornis 1888, 581; *(15)* Tristr., Cat. Coll. B. 1889, 185; *(XVI)* Meyer, Abb. v. Vogelskel. I, 1892, 40, pl. CLXVI; *(17)* Büttik., Zool. Erg. Weber's Reise Ost-Ind. 1893, III, 278; *(18)* M. & Wg., Abh. Mus. Dresden 1895, Nr. 8, p. 9; *(19)* iid., ib. 1896, Nr. 1, p. 10; *(20)* iid., ib. 1896, Nr. 2, p. 14; *(21)* Hart., Nov. Zool. 1896, 156; *(22)* id., ib 1897, 158, 162.

a. **Campephaga leucopygia** *(1)* Finsch, Neu Guinea 1866, 172; *(2)* Gray, HL. 1869, I, 336, Nr. 5074; *(3)* Rosenb., Mal. Archip. 1878, 273.

b. **Coracina leucopygia** *(1)* Heine & Rchw., Nomencl. Mus. Hein. 1890, 69.

"Maspas besar", Minahassa, Nat. Coll.

"Burong minia", Malay, Minahassa, Meyer *9*, Nat. Coll.

"Konkon inewahat", Minahassa, Guillem. *13*, Hickson, Nat. in N. Celebes 1889, 91.

"Laveda", Tjamba Distr., S. Celebes, Platen *12*.

"Sosolat daka", Tonkean, E. Celebes, Nat. Coll.

Figure of skeleton, and descriptions. Meyer *XVI*; Hartlaub *2*; Brüggemann *5* (young); Sharpe *8*; W. Blasius *12* (sexual differences).

Adult [male]. General colour light slate-grey, slightly tinged with olive-grey, becoming white on rump and upper tail-coverts; wings and tail black, the middle tail-feathers and the wing-coverts washed with slate-grey, the quills edged with the same colour or a

paler tint; front of suborbital region and loral region, including the feathers concealing the nostril, chin and malar region next the bill, black; under surface as the upper, but gradually passing into white on the abdomen, flanks and under tail-coverts; under wing-coverts white, slaty grey at edge of wing; quills below dusky grey, the inner edges greyish white where they rest on the sides of the body (Manado tua, [♂], 15. IV. 93: Nat. Coll. — C 12159). Bill and feet black (Meyer *9*, Platen *12*, Guillem. *13*); iris: Minahassa — (?) brownish black (Meyer); (?) brown (Guillem.); South Celebes — milk-white (Platen); yellowish white (Everett *21*); W. Celebes — yellowish white (Doherty *22*).

Female. The female is without the black lores, chin and malar mark, and has the white on the rump and abdomen more extensively diffused (Guillem. *13*, and five specimens in the Dresden Museum, sex not ascertained).

Young. In the first plumage the general colour is, apparently, grey, white on rump and belly, each feather crossed with a subterminal bar of brown bordered with whitish.

Changing plumage. Three specimens in changing plumage have such feathers interspersed with the uniform slate-grey ones of maturity; quills, especially the inner ones, rather broadly edged with white or pale brown, the outermost tail-feathers tipped with white more broadly than in adult (N. Celebes — C 271, 3488, and another).

Measurements (14 adults — 9 ♂, 5 ♀). Wing 152—160 mm; tail 120—130 ca.; tarsus 22 ca.; bill from nostril 17—19.

Sexes. The sexes do not appear to differ in size, and differences are not apparent in specimens fromthe islands off the coast of the Minahassa.

Skeleton.

Length of cranium	53.4 mm	Length of tarso-metatarsus	23.5 mm
Greatest breadth of cranium	22.6 »	Length of digitus III	24.0 »
Length of humerus	35.8 »	Length of sternum	30.8 »
Length of ulna	41.8 »	Greatest breadth of sternum	23.0 »
Length of radius	39.3 »	Height of crista sterni	10.0 »
Length of manus	41.0 »	Length of coracoideum	25.0 »
Length of metacarpus	23.5 »	Length of scapula	30.0 »
Length of digitus principalis	7.3 »	Length of clavicula	25.0 »
Length of femur	27.0 »	Length of pelvis	36.0 »
Length of tibia	38.3 »	Greatest breadth of pelvis	23.5 »
Length of fibula	26.0 »		

Breeding habits. Unrecorded.

Distribution. Celebes, the islands off the coast, and ? Great Sangi: — Minahassa (Wall. *8*, Meyer *9*, Guillem. *13*, etc.); Talissi Id. (Guillem. *13*, Hickson); Banka, Lembeh, Mantehage and Manado tua (Nat. Coll. in Dresd. Mus.); Togian Is. (Meyer *9*); Tonkean, E. Celebes (Nat. Coll.); West Celebes (Doherty *22*); S. Peninsula: Macassar (Wallace *8*, Weber *17*, and others), Tjamba Distr. (Platen *12*), Maros (Weber *17*), foot-hills of Bonthain (Everett & Doherty *21*, *22*); ? Great Sangi Island (Meyer *7*, *11*, *14*).

A single young example is known from Great Sangi. As Dr. Sharpe remarked on comparing this with a young bird from Celebes, nothing can be said as to the distinctness of the Sangi bird as a species. It is also recorded by Dr. Lenz as having been received from the Sangi Islands through von Bültzingslöwen, who had brought together a collection with the help of native hunters.

Remark. There is no appreciable difference between birds of South and North Celebes.

This is a plentiful species in North Celebes and the islands off the coast. In Talissi Hickson speaks of it as being as plentiful as the blackbirds and thrushes in English woods. It feeds, says Meyer *(9)*, on ants, larvae, etc.

G. leucopygius is perhaps most nearly related to *G. papuensis* (Gm.) of the Moluccas and Papuasia; somewhat further removed from *G. javensis* of Java. From both it may be distinguished by its white rump. Its uniform plumage is a recent development of the genus *Graucalus*, as shown by the barred pattern of the young. Several species of *Graucalus* have a barred under surface when adult, and in this respect may be regarded as ancient forms. It is worthy of note that such forms occur both in the Oriental and Australian Regions, for attention is thereby drawn — perhaps erroneously — to a period when *Graucalus*, as a bird with a barred under surface, ranged from the Oriental countries to Australia, and the conclusion follows that it has since then become differentiated more or less highly into the local species of the present time. But a barred or squamous plumage is also assumed by the *Muscicapidae* when young, and this pattern in young of the *Campophagidae* is probably due to some affinity of the two groups. It may be unprofitable to attempt to reconcile the two hypotheses.

* 156. GRAUCALUS TEMMINCKI (S. Müll.).

Blue Cuckoo-shrike.

a. **Ceblepyris temminckii** *(1)* Müll., Verh. N. Comm. 1839, 191; *(2)* Schl., Hdl. Dierk. 1857, 289.

b. **Campephaga temminckii** *(1)* Gray, Gen. B. I, 1846, 283, Nr. 23; *(2)* Finsch, N. G. 1866, 172 (nec Sula); *(3)* Gray, HL. 1869, I, 337, pt.; *(4)* Ros., Mal. Arch. 1878, 273.

Graucalus temmincki *(1)* Bp., Consp. 1850, I, 354; *(2)* Hartl., J. f. O. 1864, 446, pt. (nec Sula); *(III)* Walden, Tr. Z. S. 1872, VIII, 68, 113, pl. XII; *(4)* Lenz, J. f. O. 1877, 374; *(5)* Meyer, Ibis 1879, 129; *(6)* Hartert, Kat. Vog. Slg. Senckb. Mus. 1891, 92; *(7)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 9; *(8)* iid., ib. 1896, Nr. 2, p. 15.

c. **Artamides temmincki** *(1)* Sharpe, Mitth. Mus. Dresden 1878, III, 363; *(2)* id., Cat. B. IV, 1879, 15; *(III)* Gould, B. N. Guinea II, pl. 2 (1880); *(4)* W. Blas., J. f. O. 1883, 137.

"Maspas biru", Minahassa, Nat. Coll.; **"Tulia"**, Tonkean, E. Celebes, Nat. Coll.

Figures and descriptions. Walden *III*; Gould *c III*; Hartlaub *2*; Sharpe *c 2*.

Adult. China-blue; ear-coverts, sides of occiput and nape washed with purplish or campanula-blue; tail darker blue; remiges dusky, the exposed webs blue like the back; lores, feathers next the nostril, chin and malar region next the bill black; under wing-coverts China-blue; quills below dusky smoke-grey; tail below black. "Iris light blue" (♂, above Tomohon, N. Cel. 16. III. 94: Sarasin Coll.).

Bill and feet black; iris (?) light brown (Platen in Mus. Nehrk.: ♂ ad. Rurukan, 3. VIII. 84 — Nr. 936).

Female. The female has black lores like the male, but is of a less bright blue and the bill is smaller (2 ♀♀, Tomohon, Sarasin Coll.).

Variation. The single specimen sent to the Dresden Museum from the Eastern Peninsula is lighter blue than the northern birds, and the bill is long and more slender than in the latter. The difference may be individual, but is more likely racial in character.

Measurements.	Wing	Tail	Tarsus	Bill from nostril
a. (Mus. Nehrk.) ♂ ad. Rurukan	154	160	23	17
b. (C 10800) ad. near Tondano, Aug.—Sept.	157	156	23	20
c. (C 10802) ad. near Tondano, Aug.—Sept.	162	166	—	17.5
d. (C 10801) ad. near Tondano, Aug.—Sept.	161	155	24	—
e. (Nr. 2211) ad. Minahassa	158	158	24	—
f. (Sarasin Coll.) ♂ ad. Tomohon, 16. III. 94 . . .	160	160	24	19
g. (Sarasin Coll.) ♀ ad. Tomohon, 6. V. 94	155	150	—	17.5
h. (Sarasin Coll.) ♀ ad. Tomohon, 14. VII. 94 . . .	160	160	—	17.5
i. (C 14414) ad., Tonkean, E. Celebes (Nat. Coll.) . .	153	150	23.5	20

Distribution. North Celebes: Gorontalo (Forsten *2*); Minahassa — Kakas, 2000 ft. ca. (Meyer *5*), Rurukan, 3000 ft. ca. (Platen in Mus. Nehrkorn), near Lake Tondano, 2000 ft. ca. (Nat. Coll. in Mus. Dresd.), Tomohon 2500 ft. ca. (P. & F. Sarasin); Tonkean, E. Celebes (Nat. Coll.).

The Blue Cuckoo-shrike of Celebes appears, as Gould remarks, only to inhabit the mountains, this surmise receiving confirmation from the specimens obtained since by Dr. Platen, the Drs. Sarasin and by our native hunters in North Celebes. No specimens up to the present have been recorded from the lowlands.

In his "Studies of the *Campophaginae*" *(2)* Dr. Hartlaub rightly speaks of this species as quite aberrant in coloration. It is the only blue *Graucalus*. It is also remarkable as having the tail as long or longer than the wings. In this respect it agrees with *G. caeruleogriseus* (Gray) of New Guinea, Aru and Jobi, a form which also corresponds best with *G. temmincki* in colour, being bluish slaty, but in bulk it is twice as big. *G. caeruleogriseus* again bears much resemblance to *G. boyeri* of New Guinea, as Salvadori points out, but this form seems to be less nearly related to the Celebes species. *G. temmincki* must be regarded as a very distinct species, having its nearest affinities in Papuasia, and its presence in Celebes may not be easy to account for.

* 157. GRAUCALUS SCHISTACEUS (Sharpe).

Sula Cuckoo-shrike.

a. **Graucalus temminckii** part. *(1)* Wall., P. Z. S. 1862, 342 (Sula); *(2)* Hartl., J. f. O. 1864, 446 (Sula).

b. **Campephaga temmincki** part. *(1)* Finsch, Neu Guinea 1866, 172 (Sula); *(2)* Gray, HL. 1869, I, 337, Nr. 5081 (Sula).

c. **Artamides schistaceus** *(1)* Sharpe, Mitth. Mus. Dresden 1878, III, 363; *(2)* id., Cat. B. 1879, IV, 11; *(3)* Salvad., Orn. Pap. 1881, II, 127.

Graucalus schistaceus *(1)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 2, 14.

"Zaal", Banggai Id., Nat. Coll.

Descriptions. Sharpe *c 1*, *c 2*.

Adult [male]. Entire head, neck and throat black; remaining plumage dull slate-grey, equally dark above, below and on the under wing-coverts; remiges and tail black,

the former with slate-grey edges above and much paler below, inclining to whitish on the inner webs; bill black; legs and feet in skin blackish (Banggai Id., V.—VIII. 95; Nat. Coll. — C 14710).

Adult [female]. Slate-grey as in the male, but the head, neck, and throat uniform with the rest of the plumage, blackish only on the lores and ear-coverts (Banggai — C 14711).

The type of the species is a female from Sula and is described by Sharpe as follows: Like *G. pollens* of the Kei Islands, but smaller, and paler ashy; the feathers at the base of the nostril, loral plumes, and feathers in front of the eye dull blackish, not glossy black as in *G. pollens*. Wing 161 mm; tail 145; tarsus 24; culmen 27.

G. pollens is described as deep lead-grey; under wing-coverts concolourous, the greater series grey, finely tipped with black; quills blackish, below greyish; tail-feathers black, the outermost paler at the tip; iris, bill and feet black (ex Salvad.).

Measurements. Wing 154, 157 mm; tail 130, 132; tarsus 22.5, 24; bill from nostril 18, 20.

Distribution. Sula Islands (Allen *a 1*, *c 2*); Banggai Island (Dresden and Tring Mus.).

A single specimen, apparently a female, of this species was obtained by Allen in Sula Besi or Sula Mangoli, and it was described in 1878 by Dr. Sharpe as *G. schistaceus*. In 1895 the native hunters working for the Dresden Museum collected four examples in Banggai, but, as we pointed out in describing the collection *(1)*, they may prove to be racially different from *G. schistaceus*, since the type of that species is said by Sharpe to have the "under wing-coverts blackish, much darker than the breast", whereas in the Banggai birds they are concolourous with the breast.

G. schistaceus is one of a number of closely related geographical species. *G. lavatus* (S. Müll.) of Java is below paler grey than above, while *G. schistaceus* is equally dark above and below. It has affinities also with the following forms: *G. normani* Sharpe from Kini Balu (Ibis 1887, 438), the male of which is without the black head, *G. melanocephalus* Salvad. of Sumatra (Ann. Mus. Civ. Gen. 1879, XIV, 206), which differs in respect of the tail, *G. mindorensis* (Steere), without a black head in the male, but with the black of the lores extending about the eye (List B. Philipp. 1890, 14), and *G. guillemardi* Salvad. of Sooloo, a race of *G. pollens*. Prof. W. Blasius (J. f. O. 1890, 142), misled by the similarity of the orthography, has recorded *G. schistaceus* from Sooloo, but Mr. Wallace was never in this group, which is inhabited by *G. guillemardi*.

Graucalus atriceps (S. Müll.). Celebes was indicated as the habitat of this species by Salomon Müller. This locality, as Salvadori remarks, is certainly erroneous (Orn. Pap. II, 128), and the true habitat seems to be Ceram, where the bird was rediscovered by Wallace.

158. GRAUCALUS MELANOPS (Lath.).

Black-faced Cuckoo-Shrike.

a. **Corvus melanops** *(1)* Lath., Ind. Orn. Suppl. II, p. XXIV.

Graucalus melanops *(1)* Gould, B. Austr. 1848, II, pl. 55; *(2)* Sharpe, Cat. B. 1879, IV,

30; *(3)* Salvad., Orn. Pap. II, 1881, 130; *(4)* id., Agg. 1890, 88; *(5)* Buller, B. N. Zeal. 2nd ed. 1888, I, 66; *(6)* M. & Wg., Abh. Mus. Dresden 1896, Nr. 2, 15.

"Belajal", Peling Island, Nat. Coll.

For full synonymy and references see Salvadori *3, 4.*

Figure and descriptions. Gould *I*; Sharpe *2*; Salvadori *3*; Buller *5.*

Male. Light grey; forehead, face, ear-coverts, chin and throat black; primaries blackish, edged with whitish, secondaries externally grey like the back; tail black, tipped with white (c. 20 mm broad in the outermost feathers), middle feathers brownish grey, terminally blackish; breast grey like the back, paling into white on the abdomen and under tail-coverts; under wing-coverts and quills where they rest upon the body white, distally grey: bill and feet black, paler at base of mandible (Peling Id., V.—VIII. 95: Nat. Coll. — C 14569).

Female. Differs from the male by having the lores and ear-coverts only blackish; forehead, supraloral region, chin, and malar region whitish, throat barred with greyish; breast and sides rather obscurely barred with light grey and white (Peling, V.—VIII. 95: — C 14568).

Measurements. Wing 182—192 mm; tail ca. 140; tarsus ca. 26; bill fr. nostr. 19—20 (Peling Id.).

Nest and eggs cf. Gould *I.*

Distribution. Australia and New Zealand ("accidental visitor" — Buller *5*); Papuasia, the Moluccas, Timorlaut, Timor, Sumba *(6)*, Peling (Dresden and Tring Mus.).

For exact localities cf. Salvadori *3, 4.*

Four examples of this species were recently obtained in Peling by our native hunters. In size they are smaller than Australian specimens, but have a relatively larger bill, though not so large as in one from Sumba. In size they are equal to examples from Aru, Timorlaut, etc. It would be unsafe to predict that the bird varies locally, as it is not strictly stationary in Australia and has straggled to New Zealand, nor can it be safely assumed that it is stationary in Peling.

For habits, etc. cf. Gould *I.*

It bears some resemblance to *G. leucopygius*, but is much larger, lighter grey, and the face and throat of the male are black.

GENUS EDOLIISOMA Jacquin. Puch.

A group of species smaller than *Graucalus* in size, not exceeding the dimensions of a Thrush, and differing from *Graucalus* chiefly by the shorter wing, smaller bill, and the much greater contrast in coloration between the sexes. The wing is less than 6 times the length of the tarsus — about 4—5½ times this length; the males are commonly slate or black in general colour, the females usually either barred below on a pale ground-colour, or saturated with some rufous tint. The females afford the best characters for the species, and the young take after them. The genus is found from Australia to the Philippines.

* 159. EDOLIISOMA MORIO (S. Müll.).

Celebesian Slaty Cuckoo-shrike.

Plate XXII.

a. **Ceblepyris morio** *(1)* S. Müll., Verh. Natuurk. Comm. 1839—43, 189.

b. **Campephaga morio** *(1)* Gray, Gen. B. 1846, I, 283, Nr. 39; *(2)* Bp., Consp. 1850, I, 353; *(3)* Hartl., J. f. O. 1865, 155; *(4)* Finsch, Neu Guinea 1866, 172; *(5)* Rosenb., Malay. Archip. 1878, 273.

c. **Campephaga melanolaema** *(1)* Gray (nec Temm.) HL. 1869, I, 338, Nr. 5099 (fide Wald. *d I*).

d. **Volvocivora morio** *(1)* Wald., Tr. Z. S. 1872, VIII, 69, pl. VIII, fig. 1; *(2)* Brüggem., Abh. Ver. Bremen 1876, V, 71; *(3)* Meyer, Ibis 1879, 130; *(4)* Hart., Nov. Zool. 1896, 156; *(5)* id., ib. 1897, 162.

Edoliisoma morio *(1)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 657; *(2)* Sharpe, Mitth. Mus. Dresden 1878, III, 369; *(3)* id., Cat. B. 1879, IV, 54; *(4)* Salvad., Orn. Pap. 1881, II, 150; *(5)* W. Blas., J. f. O. 1883, 137; *(6)* Guillem., P. Z. S. 1885, 553; *(VII)* Meyer, Abb. v. Vogelskel. 1892, I, pl. CLXVII, p. 41; *(8)* Büttik., Zool. Erg. Weber's Reise Ost-Ind. 1893, III, 278; *(9)* Sharpe, Bull. B. O. C. 1893, Nov. 28th; Ibis 1894, 122; *(10)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 9; *(11)* iid., ib. 1896, Nr. 1, 10; *(12)* iid., ib. 1896, Nr. 2, 15.

"Toktok ruoit", Minahassa, Guillem. *6.*

"Maspas rangdang", ♀, Minahassa, Nat. Coll.

"Maspas posi posi", ♂, Minahassa, iid.

"Uwentang", Tonkean, E. Celebes, iid.

Figures and descriptions. Walden *d I*; Meyer *VII* (skeleton); S. Müller *a 1*; Hartlaub *b 3*; Brüggemann *d 2*; Sharpe *3*.

dult male. Bluish slate-grey, terminal fourth of the two middle tail-feathers black, the others black, the two outermost tipped with slate-grey for 10 mm ca.; wings black, bordered with cinereous, very broadly on the secondaries and greater wing-coverts; lesser wing-coverts like the back; lores, superciliary line, sides of face, ear-coverts, chin and throat black, becoming blackish slaty on the breast which passes into slate-grey like the upper surface on the remaining under parts, but rather darker; under wing-coverts slate-grey; quills below dusky smoke-grey, inner webs where they rest upon the sides of the body white; tail below black (near Tondano, [♂], Aug.—Sept. 1892: Nat. Coll. — C 10803; Rurukan, ♂, 15. VIII. 84: Platen in Mus. Nehrkorn, Nr. 937). Iris brown; bill and feet black (Platen ib.).

Adult female. Above like the male but paler; in front of eye dusky; entire under surface and under wing-coverts cinnamon, closely barred with blackish (as in the Wryneck, *Iynx torquilla*), except on [the under tail-coverts which are uniform cinnamon. (Rurukan, ♀, 15. VIII. 84: Platen in Mus. Nehrkorn.) Quills below where they rest upon the sides of the body buffy instead of white ([♀ ? juv.] Manado, C 52 01). "Bill black; legs black, feet below yellowish; iris dark" (P. & F. S.).

Immature in changing plumage. Like the female, but the quills and greater wing-coverts margined with pale cinnamon and the latter broadly tipped on the outer web with the same colour, a small black bar running across the cinnamon mark; some of the lesser wing-coverts still tipped with cinnamon (Lotta, 18. V. 93: Nat. Coll. — C 12177).

Young. The young of both sexes appear to differ from the female adult as above.

Measurements.	Wing	Tail	Tarsus	Bill from nostr.
a. (Mus. Nehrk. 937) ♂ ad. Rurukan	118	107	21	15
b. (C 10803) [♂] ad. near Tondano	118	100	—	15.7
c. (C 10804) [♂] ad. near Tondano	122	103	22	—
d. (C 12177) imm. Lotta, Minahassa	114	100	22	14.7
e. (C 5201) imm. Manado	121	102	21	14.5

The tail measurements are only approximate. Eight additional specimens from the N. Peninsula and Lembeh Island (Sarasin Coll. 5, Dresd. Mus. 3) have the wing 113—120 mm. The female does not seem to be smaller than the male.

Four females and young from East Celebes: wing 112—120 mm.

Three from the S. Peninsula (Sarasin Coll. ♀ from Pare Pare; Dresd. Mus. ♂ ♀ Macassar and Indrulaman, Everett): wing 111—115 mm.

Variation. As the plumage gets worn, it seems to take a slightly brownish tinge, less blue, on the slate-grey of the upper parts, and the throat gets blacker in the male, losing the bluish gloss.

A noticeable point of individual (or perhaps age-) variation in the male is seen in the black of the throat which extends more on to the breast in one or two individuals from the same neighbourhood of the Minahassa than in others.

Females from N. Celebes probably become more regularly and closely barred below with age. The bars in the young are less close, the head above less blue, having a very slight brownish tinge thereon.

As to local variation, the females and young males from Tonkean, E. Celebes (we have not seen the old male), are of a slightly lighter and brighter bluish tinge above; the bars on the chin and throat are smaller and less close than in old females from North Celebes.

The greatest extremes of differentiation yet known are found in the Northern and in the Southern Peninsulas. The Southern female is much paler cinnamon below, inclining to whitish towards the throat and chin, the bars narrower and fewer, especially on the chin, throat and abdomen; the upper parts paler and with less of a blue tinge (♀ ad. Indrulaman, Oct. 1895: Everett — C 14904).

The male of S. Celebes differs from the male of N. Celebes in having a slightly paler and brownish tinge, less blue above, the black of the chin and throat not extending on to the chest, the black subterminal spot on the two middle tail-feathers small (♂, Macassar, Sept. 1895: Everett — C 14897).

A young female, changing into adult dress, differs from Northern specimens chiefly by the under parts being much clearer of bars, the under wing-coverts and metacarpal edge uniform cinnamon, the upper parts paler, the black spot on the two middle tail-feathers small (♀ vix ad., Pare Pare, 30. VII. 95: Sarasin Coll.).

The Southern bird is *the typical Edoliisoma morio*, S. Müller having visited Macassar and Bonthain in 1828, but not N. Celebes, and the Northern individuals, displaying apparently an extreme of racial differentiation, may be distinguished as:

Edoliisoma morio septentrionalis.

The Eastern birds seem to stand nearer to the Northern than to the Southern ones, as is indicated by the formula:

Edoliisoma morio < septentrionalis.

Mr. Doherty's examples from West Celebes also seem to be intermediate (see Hartert *d 5*), shown by the formula:

Edoliisoma morio — septentrionalis

or, if they stand nearer to the Northern birds and are yet not the same as the Eastern ones, it might, or might not, be desirable to employ more complex formulae.

Skeleton.

Length of cranium	47.3 mm	Length of tarso-metatarsus	19.5 mm
Greatest breadth of cranium	19.7 »	Length of digitus III	20.0 »
Length of humerus	27.0 »	Length of sternum	25.6 »
Length of ulna	31.8 »	Greatest breadth of sternum	18.0 »
Length of radius	28.0 »	Height of crista sterni	8.5 »
Length of manus	29.0 »	Length of coracoid	22.0 »
Length of metacarpus	16.8 »	Length of scapula	24.0 »
Length of digitus principalis	12.8 »	Length of clavicula	22.3 »
Length of femur	24.0 »	Length of pelvis	29.0 »
Length of tibia	33.0 »	Greatest breadth of pelvis	17.8 »
Length of fibula	13.0 »		

Nest and eggs. Unrecorded.

Distribution. Celebes: Minahassa (Wallace *3*, Meyer *d 3*, etc.), Lembeh Id. (Nat. Coll.), Bolang Mongondo Distr. (P. & F. Sarasin), Gorontalo (Leyd. Mus. *b 3*), Tawaya, W. Celebes (Doherty *d 5*), Tonkean, E. Celebes (Nat. Coll.), Palopo, Gulf of Boni (Weber *8*), Pare Pare, S. W. Cel. (P. & F. S. *11*), Macassar (Wallace *3*, Weber *8*), Indrulaman, S. Cel. (Everett *d 4*).

The genus *Edoliisoma* ranges from Australia, New Caledonia and Papuasia to Timor, Celebes, the Philippines and an island of the Caroline Archipelago, Uap. These Cuckoo-shrikes are a good deal similar in the male sex to members of the genus *Graucalus*; the females, however, generally differ notably from the males and from one another, affording the best means of distinguishing the species. The young generally resemble their respective mothers, but where the females are uniform grey below, as in *E. panayensis* Steere of Guimaras and Panay and *E. everetti* Sharpe of Sooloo — thus approaching the male plumage, the young will most likely be found to have a dress of their own. The other members of the genus are at once instructive and puzzling. It may be inferred that the female plumage is more ancient than the male, yet the females of the several species have varied amongst themselves so much that the ancestral type of plumage cannot be made out — with our present knowledge at least. The young, resembling their mothers, afford no clue. The maternal specific differences — recently acquired — are straightway impressed upon the plumage of the young, overwhelming the older phylogenetic peculiarities which might then be expected to display themselves. It serves as a warning that the exact ancestral plumage of the genus or family is never shown by a young bird — or the young of the different species would be exactly alike — and that the recent acquisitions of the species obscure more or less the transient phylogenetic characters which should come to view in the growing bird; moreover, the acquisitions of

the mother in the genus *Edoliisoma* are impressed upon the male young at an earlier stage than the acquisitions of the father. In *Edoliisoma* the paternal characters are first displayed when the young male assumes its second plumage. Sharpe says that the young male of *E. nigrum* "gradually gains the adult male plumage by the double action of a direct moult and by a change of feather" (Cat. B. IV, 46). What the very earliest stages of plumage of these Cuckoo-shrikes will teach us, we cannot yet know, probably not much.

In the stomach of a specimen of this bird the Drs. Sarasins found crickets. *E. morio* of Celebes is a very distinct species. It is apparently most nearly related to *E. talautensis* of Talaut and *E. salvadorii* of Sangi, also to Dr. Sharpe's newly described *E. everetti* of Sooloo, the male of which is said scarcely to differ from the male of *E. morio*, but the female has the entire belly cinereous *(9)*, and to *E. emancipata* Hart. of Djampea. The male of *E. meyeri* of Mysore is also much like the male of *E. morio*, but the female is quite different, being uniform fulvous rufescent below or with a few spots, not regularly barred like the female of *E. morio*. Altogether much similarity is found amongst the males of *Edoliisoma*. This may be accounted for on the supposition that the males have retained the plumage of a formerly wide-spread species from which the females have deviated in various directions. *Edoliisoma* is a link of questionable value between Celebes and the Australian Region. Its occurrence in the Philippine Islands, Sooloo Islands, and Uap in the Carolines are suggestive of an exodus from the east to these islands by flight, of which these birds appear to be very capable.

* 160. EDOLIISOMA SALVADORII Sharpe.

Sangi Slaty Cuckoo-shrike.

Plate XXIII.

Edoliisoma salvadorii *(1)* Sharpe, Mitth. Mus. Dresden 1878, III, 367; *(2)* id., Cat. B. 1879, IV, 48; *(3)* Meyer, Isis, Dresden 1884, 6, 28; *(4)* W. Blas., Ornis 1888, 582.

"Dooi", Great Sangi, Nat. Coll.

Descriptions. Sharpe *1*, *2*.

Adult male (type of the species). Like the adult male of *E. morio (supra)*, but the general colour duller (slightly smoky) plumbeous slate-grey; chin, throat and chest uniform with the under surface, not black; lores and feathers in front of eye black; ear-coverts and below the eye blackish (Tabukan, Great Sangi: Meyer — Nr. 13580). Size rather larger than *E. morio*.

Female. Different from the female of *E. morio*: under surface buffy white, broadly barred (except on under tail-coverts) with brownish black, instead of deep cinnamon rather narrowly barred; middle tail-feathers blackish at the tip only — not the terminal fourth black as in *E. morio* (Great Sangi, [♀], 13th of March 1893: Nat. Coll. — C 12691).

Immature? Two other specimens which are moulting do not differ from the female, except that brown bases to the feathers of the upper surface are apparent, and in one

specimen dark subterminal bars to the feathers of the rump are seen. They may be females, or immature birds of either sex (Great Sangi: Meyer — Nr. 13579; Nat. Coll., 20. VII. 93 — C 12690).

Measurements.	Wing	Tail	Tarsus	Bill from nostril
a. (Nr. 13580) [♂] ad., Great Sangi.	126	110 c.	23.5	—
b. (C 12689) [♂] ad., Great Sangi 28. VII. 93	128	110 c.	23	14.5
c. (C 12691) ♀ ad.? Great Sangi, 13. VII. 93	124	110 c.	23	15.5
d. (Nr. 13579) imm.? Great Sangi	119	—	23	15
e. (C 12690) imm.? Great Sangi, 20. VII. 93	120	110 c.	23	15

Distribution. Great Sangi (Meyer *1*, *4*, Nat. Coll. in Dresden and Tring Museums).

Remarks. The three types of this species were acquired by Meyer in 1872—73, and five specimens were recently sent by our native collectors to the Dresden Museum, killed in July, 1893, as shown above. The species does not seem to have been obtained by Platen, Fischer, or the earlier visitors to Sangi, and the eight specimens we record appear to be the only ones from Sangi in European collections.

After *E. talautense*, the species seems to be most nearly related to *E. amboinense* (Hartl.) = *ceramense* Sharpe of Amboina and Ceram, though *E. morio* may have nearly as close affinities. The male of *E. amboinense* is described by Sharpe as pale ashy slate-colour instead of plumbeous slate-colour. The female is "creamy buff below, the throat narrowly streaked with blackish, the breast and flanks with arrow-head wavy cross lines of black", instead of nearly white below with broad bars of blackish. The distinctions between *E. salvadorii* and *E. morio* are pointed out in the description above.

* 161. EDOLIISOMA TALAUTENSE M. & Wg.

Talaut Slaty Cuckoo-shrike.

Plate XXII.

a. **Edoliisoma salvadorii** *(1)* M. & Wg. (nec Sharpe), J. f. O. 1894, 244.
Edoliisoma talautense *(1)* M. & Wg., Abh. Mus. Dresden 1895, Nr. 9, p. 5.
"Toruri", or **"Anaurida mawora"** (♂), **"Toruri tagi"**, or **"Taigej"** (♀ and ♂ juv.) Talaut, Nat. Coll.

Female. Differs from the female of *E. salvadorii* of Sangi by its having the under parts buff (not white, washed with buff in places) and the blackish bars much narrower ([♀] ad. type, Karkellang, Nov. 1894: Nat. Coll. — C 13795, and others).

Male. Apparently indistinguishable from the male of *E. salvadorii*, unless it be that the black at the tip of the two middle tail-feathers is more restricted and more sharply cut off from the grey, and the greyish white outer edgings to the secondaries and wing-coverts broader ([♂] ad. type, Kabruang, Nov. 93 — C 13121, and others).

Young. Deeper cinnamon-buff below than the female, and with scantier dusky bars, more sagittate in form; the remiges edged with cinnamon-buff; the upper parts slaty washed with brown; bill much paler (Karkellang — C 15361).

Measurements. Wing 117—126 mm; tail c. 110; tarsus c. 23; bill from nostril c. 15—16.

Distribution. Talaut Islands: Kabruang and Karkellang (Nat. Coll. in Dresd. & Tring Mus.).

Individual variation is not yet known to bridge over the gap between this bird and the Sangi form, so as to bring about their union as one species.

There is now a fine series of 19 specimens of the Talaut form in the Dresden Museum, showing every dress and transition. The females approach *E. morio* in the coloration of the under parts.

* 162. EDOLIISOMA EMANCIPATA Hart.

Djampea Slaty Cuckoo-shrike.

Edoliisoma emancipata *(1)* Hart., Nov. Zool. 1896, 170.

Adult male. Much larger than *E. morio* of Celebes, paler slaty, and without the black cheeks and throat, the lores and ear-coverts black, the latter with a bronze gloss (♂, Djampea Id., Dec. 1895: Everett — C 14862).

Wing 132—138 mm; tail 113; culmen 25—26 (bill from nostril c. 17); width of bill at nostrils 9; tarsus 23 (Hartert).

Female (immature). Under parts whitish washed with cinnamon-buff, paler than in *E. morio* and crossed with narrower brace-shaped bars of dusky; crissum and under tail-coverts cinnamon-buff clear of bars; above slaty grey, washed with olive on the back, the feathers of the rump with dusky subterminal bars and buff tips; wing-coverts and quills edged with cinnamon-buff, becoming whitish on the inner feathers; tail black, tipped with cinnamon-white, broadest on the outermost feathers, the middle pair brownish slate-grey with a black spot at the tip (♀, Djampea, Everett — C 14863).

The female is above light slaty grey, no fawn-coloured superciliary streak; ear-coverts light slaty grey, streaked with white; a slight brownish wash on the rump; wing 129—132 mm; "iris chocolate-brown; bill jet-black; legs, feet, and claws greyish black" — Ev. (Hartert).

Distribution. Djampea Island, between South Celebes and Flores (Everett).

This new species is compared by Mr. Hartert with *E. amboinense*, which differs in the female in being ashy brown above and in having a fawn-coloured superciliary streak, while the male of that species is harder to distinguish, but the wing seems to be slightly shorter and the grey edges on the wing-coverts and secondaries narrower. The male of *E. emancipata* is also hardly to be distinguished from the males of *E. salvadorii* and of *E. talautense*, except by its larger size and slightly paler slaty hue; the female is much more narrowly barred below and has a brownish tint on the rump not seen in adult females of those species.

163. EDOLIISOMA OBIENSE Salvad.

Obi Cuckoo-shrike.

Plate XXII.

a. **Campephaga melanotis** (nec Gould, nec Gray) *(1)* Wall., P. Z. S. 1862, 342; *(2)* Finsch, Neu Guinea 1866, 171, part.; *(3)* Gray, HL. 1869, I, 337.

b. **Edoliisoma muelleri** pt. *(1)* Salvad., Ann. Mus. Civ. Gen. VII, 1875, 927.

Edoliisoma obiense *(1)* Salvad., Ann. Mus. Civ. Gen. 1878, XII, 329; *(2)* Sharpe, Mitth. Mus. Dresd. 1878, III, 3, p. 369; *(3)* id., Cat. B. IV, 1879, 51; *(4)* Salvad., Ann.

Mus. Civ. Gen. XV, 1879, 36, Nr. 24; *(5)* id., Orn. Pap. II, 1881, 151; *(6)* id., Agg. Orn. Pap. 1890, 92; *(7)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 2, p. 15.

c. **Campephaga obiensis** *(1)* Guillem., P. Z. S. 1885, 570.

"Sal" (♂) Peling; **"Kuenlang"** (♂) Banggai; **"Kodopi"** (♀) Peling and Banggai, Nat. Coll.

Adult male. Similar to the male of *E. morio*, but without the black throat, though black on the cheeks, chin, lores, and ear-coverts ([♂] Peling, V.—VIII. 95 — C 14575).

Adult female. Above cinnamon-rufous, washed with chestnut on the mantle; below lighter, more orange cinnamon-rufous, palest on chin; head above and hind neck bluish slate-grey, much as in the male; lores blackish; below the eye light cinnamon; ear-coverts streaked with light cinnamon; remiges: unexposed inner portions and free ends blackish, below blackish, where they rest upon the body cinnamon-rufous; tail above and below cinnamon-rufous ([♀] ad. Peling, V.—VIII. 95 — C 14576).

Young. Similar to the female, but the head above and hind neck not slaty, but rufous brown with grey bases to the feathers and some pale buff tips; a supraloral stripe continued over the eye cinnamon-buff; bill dark horn-colour, paler below (Banggai — C 14694).

Measurements (Peling and Banggai — 4 adults). Wing 117—126 mm (the smaller measurements belonging to females); tail c. 100; tarsus c. 24; bill from nostril 15.5—16.

Distribution. Obi (Bruijn, Bernstein *4*, *5*); Bisa (Guillemard *c 1*); Sula (Allen *3*); Peling and Banggai (Nat. Coll. in Dresd. & Tring Mus.).

A male in the British Museum from Sula was identified by Sharpe with *E. obiense*, and this determination is now confirmed by a good series from Peling and Banggai, the avifauna of which is generally very much the same as that of Sula. Possibly the bill of our examples is a trifle smaller than in the Obi bird, but this is a somewhat variable character.

The female and young of this species are remarkably different from those of *E. morio* and its allies; they look as if saturated with cinnamon-rufous, and no bars on the under surface are to be seen.

GENUS LALAGE Boie.

A group of species smaller in size than those of the genus *Graucalus*; the wing always much longer than the tail, the middle toe and claw slightly shorter than the tarsus; tarsus anteriorly with 4—5 transverse scales; bill as in *Edoliisoma*, culmen shorter than the cranium; sexes dissimilar. Ranges from India to Australia and Polynesia.

Gould and, more recently, Oates do not separate this form from *Campophaga*.

* 164. LALAGE LEUCOPYGIALIS Tweedd.

Celebesian Lalage.

a. **Ceblepyris orientalis** part. *(1)* S. Müller, Verh. Natuurk. Comm. 1839—44, 190.

b. **Lalage orientalis** *(1)* Finsch, New Guinea 1866, 172.

c. **Campephaga leucopygialis** Gray, HL. 1869, I, 339, Nr. 5125 — descr. nulla!

Lalage leucopygialis *(1)* Wald., Tr. Z. S. 1872, VIII, 69, pl. VIII, fig. 2; *(2)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 658; *(3)* Brüggem., Abh. Ver. Bremen 1876, V, 72; *(4)* Sharpe, Mitth. Mus. Dresden 1878, III, 371; *(5)* id., Cat. B. 1879, IV, 98;

(6) Meyer, Ibis 1879, 130; *(7)* W. Blas., J. f. O. 1883, 137, 147; *(8)* Meyer, Isis, Dresden 1884, 30; *(9)* Guillem., P. Z. S. 1885, 259, 554; *(10)* W. Blas., Ztschr. ges. Orn. 1886, 112; *(XI)* Meyer, Abb. v. Vogelskel. 1892, I, 41, pl. CLXVII; *(12)* Büttik., Zool. Erg. Weber's Reise in Ost-Ind. 1893, III, 278; *(13)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 9; *(14)* iid., ib. 1896, Nr. 2, p. 15; *(15)* Hart., Nov. Zool. 1896, 156; *(16)* id., ib. 1897, 162.

"Maspas kokie", or **"Maspas biabia"**, Minahassa near Manado and islands off the coast, Nat. Coll.

"Merapati ise ise", Tonkean, E. Cel., Nat. Coll.

"Pakampi batu", Tjamba Distr., S. Celebes, Platen.

"Manua bembeh", Peling; **"Tejana popoloso"**, Banggai, Nat. Coll.

Figures and descriptions. Walden *I*; Meyer *XI* (skeleton); Sharpe *4*[1]); W. Blasius *10*.

Adult male. Above glossy greenish black; lower back, rump and upper tail-coverts white, slightly shaded with grey on the lower back; middle wing-coverts, most of outer webs of the greater coverts and a broad external edge to the secondaries white, a broad superciliary streak from nostril to side of occiput, malar region, lower part of ear-coverts, and entire under surface white; lores and upper part of ear-coverts black like the upper surface; wings below greyish black, where they rest upon the sides of the body white; tail black, the lateral feathers tipped with white, about 18 mm broad in the outermost pair, 10 mm in the next, 5 mm in the third (Manado, ♂, March, 1871: Meyer — C 693; Manado tua, marked ♂, 6. IV. 93: Nat. Coll. — 12138). Iris brown; bill and feet black (Guillem. *9*).

Adult female. Differs from the male in having the hind neck, mantle, upper back, and scapulars smoke-grey instead of black; the greater wing-coverts much more narrowly edged with white, the middle coverts marked with black; the white lower back, rump and upper tail-coverts washed with grey; the middle tail-feathers brownish grey, the ends black; the breast usually obscurely barred; metacarpal edge marked with black; other parts as in the male (Manado, ♀, March, 1871 — C 692, and others).

Immature. Like the adult female, but the feathers of the smoke-grey parts of the upper surface broadly tipped with light cinnamon, the feathers of the crown dusky tipped with cinnamon; the white under parts marked on the breast with dusky shaft-streaks (near Manado, Aug.—Sept. 1893: Nat. Coll. — C 10884, 10883).

Measurements (12 adults — male and female[2]). Wing 90—97 mm; tail 75 ca.; tarsus 18—20; bill from nostril 9.5—11 ca.

Skeleton.

Length of cranium	35.0 mm	Length of fibula	8.3 mm
Greatest breadth of cranium	16.0 »	Length of tarso-metatarsus	18.0 »
Length of humerus	22.3 »	Length of digitus III	16.0 »
Length of ulna	25.7 »	Length of sternum	20.5 »
Length of radius	23.7 »	Greatest breadth of sternum	16.5 »
Length of manus	25.0 »	Height of crista sterni	7.0 »
Length of metacarpus	13.8 »	Length of coracoid	18.0 »
Length of digitus principalis	10.6 »	Length of scapula	20.0 »
Length of femur	19.0 »	Length of clavicula	16.0 »
Length of tibia	27.8 »	Length of pelvis	21.5 »

[1]) In Dr. Sharpe's descriptions — instead of "adult male", read "immature male" or "adult female"!

[2]) Two or three in the female dress are probably immature males, the grey of the upper plumage being marked with black.

Egg. "Dr. Platen sent me an egg of this bird from Rurukan, which except for a difference in size, resembles those of its relations *L. sykesi* Sws. of East India, *tricolor* (Bodd.) of Australia, *terat* (Bodd.) of Java, *pacifica* Gml. from the Tonga Islands and *leucomelaena* V. & H. of Australia and the Aru Islands. The ground-colour is blue-green; the spots of liver-brown, which are somewhat large, not sharply defined, but lengthened, are equally distributed over the whole egg and form no circlet. The shell is very smooth and glossy. Size 21.5 × 16 mm. Black streaks and points as on the egg of *L. leucopygialis* are to be found on the eggs of almost all *Campophagidae* here and there, but always few and far between" (Nehrkorn MS.).

Nest. (The nest of the allied *L. terat* Bodd. [= *orientalis* Gm.] of Java is thus described by Bernstein [J. f. O. 1859, 274]: the small, flat, nest of only about 2 inches in diameter consists only of some few bents, small roots and such like, and the support most preferred for it is a bough, upon which it is built and which usually forms of itself a part of the nest bottom. Consequently the bird likes to make use of the place where a not too weak bough forms a fork for the site of the nest, which in this way also receives strong support at the sides. Externally it is spun over with spiders' and caterpillars' web, and covered with small bits of lichen. In this simple, fragile nest the female lays its two eggs.)

Distribution. Celebes — Minahassa (Wallace *5*, Meyer *6*, etc.); Banka Id. and Manado tua Id. (Nat. Coll. in Dresd. Mus.); Gorontalo Distr. (Meyer *6*); Tonkean, E. Celebes (Nat. Coll.); Tawaya, W. Celebes (Doherty *16*); Kandari, S. E. Celebes (Beccari *2*); Macassar (Wallace *5*, Weber *12*); Indrulaman (Everett *15*); Peling and Banggai Is. (Nat. Coll. *14*).

Dr. Sharpe *(5)* mentions also the Sula Islands as a locality for this species, without, however, referring to specimens.

This Pied Cuckoo-shrike is most like *L. terat* of the Philippines, Borneo, Java, Sumatra, the Malay Peninsula and Nicobars (Sharpe *5*), a species which may readily be distinguished from the Celebes form by its having the rump and upper tail-coverts grey instead of white. Specimens from Mindanao may thus be separated from Celebes ones at a glance. *L. timorensis*, which also occurs in Celebes, may be known by its grey rump and upper tail-coverts, by its having only a very narrow white line extending from the nostril and lores over the eye, instead of a broad superciliary stripe from the nostril and lores to over the ear-coverts, and by the pattern of its wing below, where the white occupies the whole inner web of most of the primaries, extending in the longer quills as far as the ends of the secondaries, while the free ends of the quills are blacker than in *L. leucopygialis*. It looks as if a sharper separation of the pigment had taken place in the wing of *L. timorensis*, the black being condensed in the outer webs and distal ends of the quills. In this respect *L. timorensis* is a more highly specialized species than *L. leucopygialis* and *terat*; in respect of its white rump *L. leucopygialis* is more highly specialized than *terat*.

L. leucopygialis is a common bird in North Celebes. It is very active, forms flocks, its call being a protracted whistle or a loud chirping cry (Meyer *6*).

The curious correspondence of the coloration of this species with *Graucalus bicolor* — sex with sex — has already been noted under that species. It has

of course nothing to do with mimicry. Either, one form has given rise to the other without change of coloration, or, the two forms have independently developed in coloration in the same direction, owing to the action of light upon the feather-pigments, as mentioned *supra* under *Graucalus bicolor*.

The traces of bars in the dress of the female are especially interesting as compared with the longitudinal shaft-streaks on the breast of the young, the former appear to point to more recent, the latter to more ancient ancestry, though we are not yet able to define this more exactly.

Another species which corresponds in coloration sex for sex somewhat closely with *L. leucopygialis* is *Muscicapula westermanni*.

165. LALAGE TIMORENSIS (S. Müll.).

Timorese Lalage.

a. **Ceblepyris timorensis** *(1)* S. Müll., Verh. Natuurk. Comm. 1839—44, 190.

b. **Campephaga timorensis** *(1)* Gray, Gen. B. 1846, I, 283, Nr. 47; *(2)* id., HL. 1869, I, 339, Nr. 5118.

Lalage timorensis *(1)* Bp., Consp. 1850, I, 355; *(2)* Hartl., J. f. O. 1865, 165; *(3)* Salvad., Cat. Ucc. Borneo 1874, 147; *(4)* Vorderman, N. Tdschr. Ned. Ind. 1886, XLVI, 229; *(5)* Everett, J. Str. Br. R. A. S. 1889, 126; *(6)* Vorderm., N. T. Ned. Ind. 1895, LIV, 337; *(7)* M. & Wg., Abh. Mus. Dresden 1896, Nr. 1, p. 10.

c. **Lalage leucophaea** *(1)* Wall. (nec Vieill.), P. Z. S. 1863, 485.

d. **Lalage timoriensis** *(1)* Finsch, Neu Guinea 1866, 172; *(2)* Sharpe, Mitth. Mus. Dresd. 1878, III, 371; *(3)* id., Cat. B. 1879, IV, 94; *(4)* Guillem., P. Z. S. 1885, 506; *(5)* Heine & Rchw., Nomencl. Mus. Hein. 1890, 67; *(6)* Büttik., Notes Leyden Mus. 1891, 212; *(7)* id., ib. 1892, 198; *(8)* id., Zool. Erg. Weber's Reise in Ost-Ind. 1893, III, 286; *(9)* Hart., Nov. Zool. 1896, 156, 165, 171, 182, 548, 561, 569, 584, 595; *(10)* id., ib. 1897, 158.

e. **Lalage dominica** *(1)* Lenz (nec Müller), J. f. O. 1877, 374 [?]; *(2)* Meyer, Ibis 1879, 130; *(3)* W. Blas., J. f. O. 1883, 124, 147.

f. **Lalage timoriensis** var. **celebensis** *(1)* Meyer, Isis, Dresden 1884, 30; *(2)* W. Blas., Ztschr. ges. Orn. 1886, 115.

g. **Lalage riedelii** *(1)* Meyer, Isis, Dresden 1884, 29.

Descriptions. S. Müller *a 1*; Hartlaub *2*; Sharpe *d 3*.

Adult male. Above greenish black; lower back, rump and upper tail-coverts pale smoke-grey; lesser wing-coverts and inner greater wing-coverts white, with spots of black along the shaft[1]); inner quills broadly bordered externally with white; a fine white streak from nostril over the eye; malar region, ear-coverts, sides of neck and entire under parts white; edge of wing marked with black; distal ends and outer webs of quills below dusky, inner webs — nearly as far in the longer primaries as the ends of the secondaries — pure white; tail-feathers narrowly tipped with white, more broadly on the two outer pairs (10 mm, 7 mm), inner webs white towards base under the under tail-coverts (Batubassi, north of Macassar, ♂, Nov. 1871: Meyer — Nr. 13617).

Adult female. Above dark broccoli-brown, becoming smoke-grey on the lower back, rump,

[1]) The black spots appear to be lost in old birds.

and upper tail-coverts; wings brown-black, the primaries narrowly, the secondaries and coverts broadly bordered with white, of an impure fulvous tint on the inner feathers; lores brownish black; supraloral stripe continued over the eye fulvous white; chin, throat, and under parts, under tail-, and wing-coverts and remiges where they rest upon the body white, with obscure cinereous bars on the sides and metacarpal edge; distal part of remiges below dusky brown; tail below blackish; the two outer feathers broadly, the next narrowly, tipped with white, and the outermost pair externally edged with the same colour (♀, Kalao, Dec. 95: Everett — C 15138).

Young. Like the female, but the feathers of the head, neck, and back tipped with white and subterminally crossed with a bar of darker brown; the wing-coverts, secondaries and primaries edged with fulvous, not white; the under parts washed with white, most strongly on the jugulum, a few blackish spots on the breast, bill dark, under mandible basally yellowish: iris brown (♂, Kalibangkere, S. Celebes, 7. VII. 78 — C 5371).

Measurements.	Wing	Tail	Tarsus	Bill from nostr.
a. (Nr. 13617) ♂ ad. Batubassi, Nov. 1871 (Meyer) . .	90	77	21	—
b. (Nr. 13615) ♂ ad. Macassar, Oct. 1871 (Meyer) . .	95	76	21	11
c. (Nr. 13616) [♂] ad. Macassar, Jan. 1873 (Meyer) . .	92	83	20	—
d. (Sarasin Coll.) ♂ ad. Macassar, 9. VII. 95	92	73	21	10
e. (Sarasin Coll.) ♀ Macassar, 13. XI. 95	92	75	21.5	11
f. (Sarasin Coll.) ♀ imm. Macassar, 4. IX. 95 . . .	90	—	—	—
g. (C 15138) ad. Kalao Id., XII. 95 (Everett)	87	73	21	11
h. (C 15137) ♀ ad. Kalao Id., XII. 95 (Everett) . . .	94	80	—	11
i. (C 15209) ♀ imm. Lombok, V. 96 (Everett) . . .	90	70	21	11
j. (C 1528) ♀ imm. Lombok, V. 96 (Everett)	92	—	—	11
k. (Nr. 13618) ad. Makisar or Kisser (Riedel)	100	88	22	—
l. (Nr. 6422) ad. Timor, Kupang (Riedel)	98	86	21	—

Distribution. Timor (S. Müller *a 1*, Wallace *c 1*, *d 3*, etc.); Kisser (Riedel *g 1*); Letti and Ombai (Leyd. Mus. *d 8*); Sumba (ten Kate *d 7*, Doherty *d 9*); Sumbawa (Guillemard *d 4*, Doherty *d 9*); Lombok (Wallace *d 3*, Vorderman *6*, etc.); Bali (Wallace *d 3*, Doherty *d 9*); Djampea and Kalao (Everett *d 9*); Saleyer (Weber *d 8*, Everett *d 9*); Celebes — South Peninsula (Meyer *e 2*, *f 1*, Platen, P. & F. Sarasin *7*, Everett *d 9*, Doherty *d 10*); ? North Peninsula (v. Bültzingslöwen *e 1*); ? Borneo (*d 1*, *3*, *5*).

This species was first discovered in Celebes by Meyer, who obtained the three specimens above mentioned at Macassar and Batubassi. These were described later as var. *celebensis (f 1)*, but after comparison with a typical specimen from Timor, which was not at hand then, we find them identical in all respects, except in size (see measurements above), and do not insist upon maintaining it as a subspecies, though it may possible be found advisable to re-establish it later on, when the species is better known. Prof. W. Blasius *(f 2)* has called attention to the probable identity of a specimen in the Lübeck Museum *(e 1)* with this form of *timorensis* indicated to have come from North Celebes, but this locality requires confirmation.

This species appears to be a recent invader from the islands in the South to South Celebes, where it occurs together with *L. leucopygialis*, a species which is peculiar to Celebes, whereas *L. timorensis* has a wider distribution. What Meyer described *(g 1)* as *L. riedeli* from Kisser near Timor does not differ in coloration from the typical form, which we are now able to compare, but whether the differences in size (see measurements above) entitle it to the rank of a subspecies, only future investigation with more specimens in hand can show.

FAMILY ARTAMIDAE.

As Gadow remarks (Newton's Dict. B. 739), *Artamus* is the only genus in the enormous group of the *Passeres* known to possess powder-down patches. "They occur in all the species, in patches on the sides of the breast, the thighs and lower back, and have a strong barrel, one-third of an inch long". They are simply coloured birds, chiefly grey or black above and white below, with very long wings, reaching far beyond the end of the tail; the first primary is minute, the second and third the longest, the secondaries rather more than half as long. The bill is about as long as the cranium, bluish in colour, the culmen rounded, almost bloated; it is covered by a cere at its base, hidden by the feathers of the forehead; nostril a roundish aperture in the horn of the bill; tarsus shorter than the toes, which form a rather large foot. They catch most of their insect-food on the wing, and their flight has been compared to that of Swallows and of Birds-of-prey. The sexes are similar, and the young closely resemble their parents; the nest and eggs are Shrike-like. Sharpe recognizes two genera, found in the Australian and Oriental Regions, and in West Africa.

Celebes has two species of this family which is most strongly represented in Australia, one peculiar, most nearly allied to a form in the New Britain group, the other a species of wide range which seems to have spread over the East Indies in recent times. As these birds have very fine flying-powers they are not of much weight in questions of geographical distribution.

GENUS ARTAMUS Vieill.

The characters as for the family. It differs from *Pseudochelidon* of West Africa by its pointed bill, which is longer than the hind toe and claw, and by its square tail (Sharpe). Australian and Oriental Regions.

166. ARTAMUS LEUCOGASTER (Val.).

White-rumped Swallow-shrike.

a. **Ocypterus leucogaster** *(1)* Valenc., Mém. Mus. d'Hist. Nat. 1820, VI, 21, pl. VII, fig. 2.
b. **Artamus leucopygialis** *(1)* Gld., P. Z. S. 1842, 17; *(II)* id., B. Austr. 1848, II, pl. 33; *(3)* id., HB. B. Austr. 1865, I, 154; *(4)* Studer, Reise Gazelle 1889, III, 189.

c. **Artamus leucorhynchus** *(1)* Gray (nec L.), Gen. B. 1845, I, 285; *(2)* Wald., Tr. Z. S. 1872, VIII; *(3)* Hume, Str. F. 1874, IV, 214; *(4)* Salvad., Cat. Ucc. Borneo 1874, 140; *(5)* Meyer, Ibis 1879, 129, 146; *(6)* Guillem., P. Z. S. 1885, 257, 409, 505, 553; *(7)* Hartert, J. f. O. 1887, 356; *(8)* Sharpe, Ibis 1890, 280; *(9)* Vorderm., Notes Leyden Mus. 1891, 125.

Artamus leucogaster *(1)* Gray, Gen. B. 1845, I, 285; *(2)* Bernst., J. f. O. 1859, 268; *(2bis)* Nat. Tdschr. Ned. Ind. 1860, XXII, 21; *(3)* Sharpe, Rowley's Orn. Misc. 1878, III, 184—187; *(4)* Salvad., Orn. Pap. 1881, II, 167—171; *(5)* Meyer, Verh. z.-b. Ges. Wien 1881, 766; *(6)* W. Blas., J. f. O. 1883, 115, 137; *(7)* id., Ztschr. ges. Orn. 1885, 278; *(8)* Büttik., Notes Leyd. Mus. 1887, 46; *(9)* North, Nests and Eggs Austr. B. 1889, 43; *(10)* Everett, J. Str. Br. R. A. S. 1889, 144; *(11)* Sharpe, Cat. B. 1890, XIII, 3; *(12)* Salvad., Orn. Pap. Agg. 1891, 93; *(13)* Hartert, J. f. O. 1891, 203; *(14)* id., Kat. Senckenb. Mus. 1891, 78; *(15)* Salvad., Ann. Mus. Civ. Gen. 1891, 56; *(16)* Büttik., Notes Leyd. Mus. 1892, 198; *(17)* id., Zool. Erg. Weber's Reise in Ost-Ind. 1893, III, 278, 286; *(18)* Sharpe, Ibis 1894, 252, 259; *(19)* Hart., Nov. Zool. 1894, 475; *(20)* Bourns & Worces., P. Menage Exp. 1894, 39; *(21)* Hart., Nov. Zool. 1895, 469; *(22)* Grant, Ibis 1895, 258; *(23)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 9; *(24)* iid., ib. 1896, Nr. 2, p. 15; *(25)* Grant, Ibis 1896, 554; *(26)* Hart., Nov. Zool. 1896, 154, 168, 534, 547, 568, 575, 583, 594; *(XXVII)* Meyer, Vogelskel. 1897, II, pl. CCXVIII.

d. **Artamus leucorhynchus** var. **celebensis** *(1)* Brügg., Abh. Ver. Bremen 1876, V, 69.

e. **Artamus celebensis** *(1)* Tweedd., Ibis 1878, 386.

"Maspas", Minahassa, Meyer *c 5.*

"Maspas sedang" (ad.), **"Maspas pontej"** (juv.), Nat. Coll.

"Djaka djaka", Tjamba District, S. Celebes, Platen *7.*

"Sosolat ise ise", Tonkean and Balante, E. Celebes, Nat. Coll.

"Manu sagu", Peling and Banggai, Nat. Coll.

For further synonymy and references see Salvadori *4, 12,* and Sharpe *3, 11* (omitting *A. musschenbroeki* Meyer and references thereto).

Figures and descriptions. Valenc. *a I*; Gould *b II, b 3*; Meyer *XXVII* (skeleton); Hume *c 3*; Salvad. *4*; Sharpe *11.*

Adult. Above mouse-grey, becoming drab on back, scapulars and rump; upper tail-coverts white; chin, throat and upper chest mouse-grey, concolorous with the head; remaining under parts, including under wing-coverts, white; loral region blackish grey; quills below grey, becoming nearly white at their bases (N. Celebes, C 3493). Bill bluish; feet bluish grey; claws blackish — Meyer *c 5.* Iris brown — Gould *b 3*; brownish — Meyer *c 5*; black (♂) — D'Albertis *4*; deep chocolate (♂) — Sharpe *7*; blue-grey (♂) — Platen *7*; dark brown (♂) — Vorderman; brown (♀) — Vorderman, Platen (see W. Blas. *7*); "as a rule deep brown, in one specimen deep slaty blue" (Andaman Is.: Davison *c 3*). It appears probable that, as in the case of *Cacatua sulphurea*, the colour of the iris changes with age.

Sexes. Similar.

Young. Differs from the adult in having the feathers of the upper surface, especially on the wing-coverts, scapulars and lower back, tipped with cinnamon; lores dusky, supra-loral region cinnamon; throat washed with whitish; under surface white, faintly barred with pale cinnamon; quills and tail tipped with whitish; bill flatter, brown (in skin), bluish towards the base (Banka Id. off the Minahassa, C 12167, C 12166, 17th and 18th May, 1893 — Nat. Coll.).

Measurements (10 adults from Celebes). Wing 134—146 mm; tail 63—68; bill from nostril 15—16.5; tarsus 18 ca.

(2 young). Wing 117, 118; tail 61, 65; bill from nostril 12.5; tarsus 18.

Skeleton. Parts of it have been treated of by Parker, Trans. Z. S. Vol. IX, 1873, 317, and Sharpe, Cat. Ost. Coll. Surg. III, 26, 1892.

Eggs. (Java) 3—4, faintly glossy ground tending somewhat to yellowish, and usually with a very well-marked and plain circlet of grey and brown spots towards the blunt end. The brown ones — usually pale liver-brown — are the more numerous and vary considerably .... the grey are pale ash-colour and seem to lie under the brown, i. e. in the shell itself. Several variations are described. Size 23—25 × 17—18 mm (Bernstein *2*). — (Australia) usually 3, flesh-white or dull white, freckled, spotted and blotched, with yellowish brown, and bluish grey, the last appearing as if beneath the surface of the shell; usually a zone at the larger end; size 22.9—24.1 × 15.7—16.0 (North *9*, Gould *b 3*). — "The eggs have a white (Java) to yellowish (Australia) ground, with large lilac spots below and similar liver-brown spots above, which form a closed circlet at the blunt end. They bring to mind the eggs of our common *Lanius collurio* and are of like size = 22—33 × 17 mm" (Nehrkorn MS).

Nest. (Java) — Exteriorly somewhat Shrike-like, usually placed amongst the many kinds of parasites which always clothe the stem of the Areng-palm, or also in the lappets formed by the leaves of this or of the cocoa-palm, and only rarely in the leafy crown of a dicotyledonous tree. Made of dry, somewhat coarse stalks, roots, leaves, bits of lichen and moss, roughly and loosely bound together giving the nest a disorderly, shaggy exterior; lined with finer materials, mostly the elastic threads of the Areng-palm, and a few soft stalks, forming a regular flattened, half-spherical receptacle (Bernstein *2*).

(Andamans). — One found was a shallow, saucer-shaped structure of grass, somewhat coarse exteriorly, finer inside, placed in the hollow at the top of a rotten mangrove stump 20 ft. high (Davison *c 3*).

(Australia). — Often avails itself of the deserted nests of other species instead of building a new one. Most of the pairs found breeding by Gould had possessed themselves of the forsaken nests of *Grallina picata*, re-lining it with grasses, etc. Nests made by the birds themselves are of grasses and fine plants, placed in the fork of a tree growing by, or in, the water (Gould *b 3*, North *9*).

Breeding season. Australia — September till January *(b 3)*; Andamans — building, May 2nd *(c 3)*; Celebes — as the two young specimens, about 2 months old, in the Dresden Museum were killed in the middle of May, it appears that the bird breeds here early in the year.

Distribution. Almost all the islands south and east of a line drawn from the Andaman Islands through the Malacca Straits to Luzon, as far as E. New Guinea, Victoria and S. Australia. For exact localities see Salvadori *4*, *12*, adding — Billiton and Mendanau (Vorderman *c 9*), Palawan (Platen *10*), Bali (Wallace *11*), Natuna Is. (Everett, Hose *19*, *21*), Sumbawa, Satonda, Sumba (Doherty *26*), several Philippine Islands (B. & W. *20*); Celebes Province — Minahassa (Wallace *11*, Meyer *c 5*, etc.); Gorontalo Distr. (Meyer *c 5*); E. Celebes (Nat. Coll. *24*); S. Celebes — Macassar (Wallace *11*, Meyer *c 5*, Weber *17*, etc.), Tjamba Distr. (Platen *7*); Saleyer Island (Weber *17*, Everett *26*); Djampea (Everett *26*); Islands off N. Celebes — Banka, Lembeh and Manado tua (Nat. Coll.); Togian Islands (Meyer *c 5*); Peling and Banggai (Nat. Coll. *24*).

As yet unrecorded from Sangi, Talaut, and Sula (?).

Artamus leucogaster is a species which appears to have recently extended its range, having issued most probably from Australia, where the *Artamidae* are most strongly represented and where *A. leucogaster* in South Australia and New South Wales "would appear to be migratory, visiting these parts in summer for the purpose of breeding" (Gould *b 3*). In the East India Islands it seems to be stationary. In Celebes, as Meyer remarks, it is very common at all times and everywhere; it is said by Fischer to occur throughout the year in Ternate; it breeds plentifully in Java, breeds also in the Andamans, where specimens have been collected in most months of the year — January till July, November, December; while the dates of specimens tend to prove that it is stationary and therefore a breeding bird in other parts. Specimens from the Tenimber Islands are distinguishable by their dusky plumage, the broader zone of white across the rump and upper tail-coverts, larger bill, and tail narrowly tipped with white. They appear to be the only form of *A. leucogaster* worthy of specific or subspecific distinction, and have been named *A. musschenbroeki* by Meyer. It would be of interest to know why Timorlaut has furnished the first appreciable differentiation of this form; but these islands seem to lie out of the way of invaders from Australia and New Guinea (see, article on *Cacatua sulphurea*). Celebesian examples have been said to be larger than others; the largest of those in the Dresden Museum are somewhat larger than those from other localities, but other adult examples from Celebes are again considerably smaller than some of the latter.

The food of *Artamus* consists of insects. Its striking habits of flight are commented on by many writers. Wallace remarks that they closely resemble Swallows in their habits and flight, and Gould compares the present species, when seen flying near the ground, to the House Martin of our own country. Bernstein speaks of its flight as having some similarity to a Bird-of-prey's, as it sails aways almost without making a stroke on outstretched wings, or alters its direction by simply raising or lowering one wing or the other. Yet this is gone through slowly with nothing of the rushing haste of the small true Falcons, or of the Swallows either *(2)*. It has the habit of sallying out from its perch and catching its insect-food on the wing, "sometimes making only a short flight, at others a very extended one before returning to the same or another perch. It frequently descends to the ground to pick up an insect, and I have at times seen several seated together on the roads" (near Port Blair, Andaman Islands, Davison *c 3*).

By many authors, as Prof. Newton (Dict. B. 1893, 22) remarks, the *Artamidae* "are considered to be the nearest neighbours of the *Hirundinidae*, making some approach to them in their long wings and habit of catching insects in continuous flights. If it be granted from their possessing patches of powder-down (Nitzsch, Pterylogr. Engl. ed. 1867, 80) that they should form a separate family *Artamidae*, its true alliance must still be guessed at".

* 167. ARTAMUS MONACHUS Bp.

White-backed Swallow-shrike.

Artamus monachus *(1)* Bp., Consp. 1850, I, 348 (ex Temm., Mus. Lugd.); *(2)* Schl., Handl. Dierk. 1857, 293; *(3)* Wall., Ibis 1860, 141; *(4)* id., P. Z. S. 1862, 340; *(5)* Finsch, Neu-Guinea 1865, 171; *(6)* Gray, HL. 1869, I, 289, Nr. 4272; *(VII)* Walden, Tr. Z. S. 1872, VIII, 67, 113, pl. VI, fig. 1; *(8)* Brügg., Abh. Ver. Bremen 1876, V, 69; *(9)* Sclater, P. Z. S. 1877, 101; *(X)* Gould, B. New Guinea IV, pl. 21 (1878); *(11)* Sharpe, Rowley's Orn. Misc. III, 1878, 189; *(12)* Rosenb., Malay. Archip. 1878, 272; *(13)* Meyer, Ibis 1879, 129; *(14)* Salvad., Orn. Pap. II, 1881, 172; *(15)* W. Blas., J. f. O. 1883, 137; *(16)* Guillem., P. Z. S. 1885, 553; *(17)* W. Blas., Ztschr. ges. Orn. 1886, 196; *(18)* Sharpe, Cat. B. XIII, 1890, 10; *(19)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 10; *(20)* iid., ib. 1896, Nr. 2, p. 15; *(21)* Hart., Nov. Zool. 1896, 154; *(22)* id., ib. 1897, 157.

a. **Artamus spectabilis** *(1)* Brügg., Ann. and Mag. N. H. 1878, (5) I, 349.

"Maspas utan" (utan = forest), Minahassa, Meyer *13*.

"Maspas kaoonerang intalung", Nat. Coll.

"Sosolat ise ise" (= also *A. leucogaster*), E. Celebes, Nat. Coll.

"Manu sagu", Banggai (= also *A. leucogaster*), iid.

Figures and descriptions. Walden *VII*; Gould *X*; Schlegel *2*; Wallace *4*; Sharpe *18*.

Adult. Entire head, including throat, cheeks, ear-coverts and nape, drab, darkest on the forehead and crown; loral region and upper corner of chin blackish; wings and tail blackish grey, the wing-coverts washed with drab; entire body above and below pure white; quills and rectrices below smoke-grey; towards their bases, and under wing-coverts, white (Near Manado, Aug.—Sept. 1892, Nat. Coll.: C 10881). Bill pale blue; feet lead-colour (Wall. *4*).

Sexes. No sexual differences of plumage are known, and do not appear to exist.

Young. Like the adult, but the remiges and wing-coverts tipped with white; a little white at the tip of the tail; the brown feathers of the head and neck with very narrow whitish edgings; the throat greyer, with whitish tips to the feathers (♀ juv. Tomohon, N. Cel., 30. V. 94: Sarasin Coll.).

Eggs, etc. Unrecorded.

Measurements (9 specimens). Wing 152—164 mm; tail c. 70—78; bill from nostril c. 19—20; tarsus c. 20.

Distribution. Celebes and the Sula Islands: — Minahassa (Wallace *3*, Meyer *13*, etc.); Lembeh Id. (Nat. Coll.); Banggai Id. (Nat. Coll.); Sula Mangoli, or Sula Besi, or both (Allen *4*); Indrulaman, S. Celebes (Everett *21*).

Until very recently, on the mainland of Celebes this Wood-swallow or Swallow-shrike had been definitely recorded only from the Minahassa, where Wallace, Meyer and the Sarasins met with it in the highlands of the country; but in 1895 it was found by Everett on the foot-hills of Mt. Bonthain, and there also in 1896 by Doherty at 6000 feet. Its nearest affinities are with *Artamus insignis* Sclat. of the New Britain group, the only other known species of *Artamus* which has a white back. This bird may be distinguished from the Celebes form by its black head, wings and tail (see: Gould, B. New Guinea, IV, pl. 20). Bonaparte, who can only have seen the bird without taking it out

of the show-cases in the bad light of the Leyden Museum, unfortunately described *A. monachus* in his six-worded diagnosis as having these parts black, thus making his description better applicable to *A. insignis*, but we do not find with Brüggemann that this is a sufficient reason for cancelling the name.

The pure white back of these two *Artami* shows a rather anomalous condition among birds; *Cracticus* and *Myristicivora* are other instances of it, not taking into consideration, of course, those of entirely white plumage.

In its habits *A. monachus* corresponds with *A. leucogaster*. It "feeds on insects, butterflies on the wing, grasshoppers, etc. Sits quiet on a tree till it sees its prey, then rushes on the flying animal and returns. Flies in flocks. Cries 'tschirr-woouit' twice; at the same time a trembling movement goes over the wings and the body, chiefly over the wings" (Meyer, *13*).

This species may be easily distinguished from *A. leucogaster* by its white back.

FAMILY DICRURIDAE.

The Drongos are easily distinguished from other *Passeres* by their forked tail of 10 feathers, the lateral feathers having an outward curl, and by their black plumage with metallic glosses in places. The sexes do not differ in coloration.

GENUS DICRURUS Vieill.

Bill as long or longer than the cranium, strong, tapering, slightly decurved, ridge of culmen high and sharp, tomia slightly notched; nostril roundish, ossified, with a coriaceous area behind, screened with bristles and dense feathers from the forehead; large rictal bristles; tail well forked, nearly as long as the wing; wing rather long, 1st primary about half its length, 3rd—6th the longest; hind toe and claw as long as the middle toe and claw, tarsus hardly longer, anteriorly scutellated. Oriental, Australian, and Ethiopian Regions.

The Celebes Drongo, when adult, has white eyes, a peculiarity of equal interest with the black bill of the Celebes forms of *Pelargopsis* and *Eudynamis*. The Sula and Obi Drongo has red eyes. Old birds of both often have a few long fine hairs — the shafts of web-less feathers — growing backwards from the forehead. *Dicrurus hottentottus* has a crest of such hairs. They undoubtedly point to an affinity of the three forms, but the exact meaning of such growths is merely a matter of speculation.

* 168. DICRURUS LEUCOPS Wall.

White-eyed Drongo.

Plate XXIV.

We find it impossible to separate *D. axillaris* (Salvad.) of Great Sangi as a distinct species, since specimens from Siao are intermediate as regards the

distinguishing characters (though not in size) between it and the typical form of Celebes. *D. leucops* should, therefore, be held to consist of the two subspecies, *the typical D. leucops* and *D. leucops axillaris*, while the Siao birds may be known as *D. leucops—axillaris*.

1. The typical Dicrurus leucops.

a. **Dicrurus leucops** *(1)* Wall., P. Z. S. 1865, 478; *(2)* Gray, HL. I, 1869, 285, Nr. 4224; *(3)* Wald., Tr. Z. S. 1872, VIII, 70; *(4)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 658; *(5)* Brügg., Abh. Ver. Bremen 1876, V, 72; *(6)* Lenz, J. f. O. 1877, 375; *(7)* Meyer, Ibis 1879, 131, 146; *(VIII)* id., Abb. v. Vogelskel. 1882, I, p. 21, pl. XXVI; *(9)* W. Blas., J. f. O. 1883, 125, 137; *(10)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 10; *(11)* iid., ib. 1896, Nr. 1, p. 10; *(12)* iid., ib. 1896, Nr. 2, p. 15; *(13)* Hart., Nov. Zool. 1896, 155, 168; *(14)* id., ib. 1897, 162.

b. **Dicrurus pectoralis** part. *(1)* Finsch, Neu Guinea 1865, 170.

c. **Chibia leucops** *(1)* Sharpe, Cat. B. III, 1877, 241; *(2)* Guillem., P. Z. S. 1885, 554; *(3)* Hickson, Nat. in N. Celebes 1889, 91; *(4)* Büttik., Zool. Erg. Weber's Reise Ost-Ind. 1893, III, 278.

d. **Dicruropsis leucops** *(1)* Sharpe, Mitth. Mus. Dresd. 1878, III, 361 (Celebes, Siao, Great Sangi); *(2)* Salvad., Atti Ac. Sc. Tor. 1878, XIII, 1185; *(3)* id., Orn. Pap. II, 1881, 174; *(4)* Meyer, Isis, Dresden 1884, 6, 31 (Siao); *(5)* W. Blas., Ztschr. ges. Orn. 1885, 281; 1886, 117; *(6)* Platen, Gefied. Welt 1887, 205; *(7)* W. Blas., Ornis 1888, 637 (Siao).

"Burong gunting", Malay name (= Scissor-bird), Minahassa, Meyer *a 7*, Guillemard *c 2*, Nat. Coll.

"Titikak", Minahassa, iid.

"Kesi", Tonkean and Balante, E. Celebes, iid.

"Tschibang", Tjamba Distr., Platen *d 5*.

"Karangsinga", Siao, Tagulandang, and Biarro, Nat. Coll.

Descriptions. Sharpe *c 1*; Brüggemann *a 5*; W. Blasius *d 5*.

Adult. Black: — feathers of crown, sides of neck, throat, and breast with broad tips of metallic steel-blue, greener on the breast; back and scapulars velvety black, the latter slightly metallic; wings and tail metallic steel-green; forehead, sides of head, chin, and under surface below the breast velvety black; under wing-coverts metallic; wings and tail below shining dusky black, the two outermost tail-feathers lengthened and curved outwards and upwards towards the ends (N. Celebes, C. 3590). Iris white (Wallace *a 1*, Meyer *a 7*, Platen *d 5*, Guillemard *c 2*, etc.); feet, claws, and bill black (*a 7*, *d 5*, *c 2*).

Sexes. Alike in coloration.

Remark. In some old individuals some fine bare shafts arise from the base of the forehead, growing backward as far as the nape (C 12193, C 3590).

Variation. In most specimens from Celebes, the islands off the coast, and Siao, but particularly in the younger individuals, the under wing-coverts and axillaries are more or less tipped with white. These tips are best developed in specimens from Siao which are sometimes (C 12594 and 12595) inseparable from *axillaris* of Great Sangi.

Nestling. Very like the adult, but the under surface glossless sooty black, without metallic tips on the throat and breast; upper surface glossed with blue-black on head and mantle but without metallic tips. Wings glossed with metallic green and blue as in the adult: "iris brown" (♂, Tomohon, 21. IV. 94: Sarasin Coll.).

Young. Like the adult, but the iris sepia (P. & F. Sarasin), the lateral tail-feathers much

less curled, fewer metallic spots on the throat and breast, the under wing-coverts usually more spotted with white (♀ ?, Kema, Feb. 1894: Sarasin Coll., and others).

Measurements.	Wing	Tail	Tarsus	Bill from nostril
a. 28 specimens from N. and S. Celebes, Togian, Banka, Manado tua and Mantehage . . .	148—169	c. 130	c. 25	21.5—26
b. 3 from Biarro, Gunong Api and Tagulandang .	165—167	c. 140	—	—
c. 6 specimens from Siao	167—178	c. 140	c. 26—27	24—27

The largest and smallest specimens of the group *a* are both from the mainland of Celebes. Those with recurved bristles sprouting from the forehead (six in number) — apparently the oldest — are also on an average the largest specimens (wing 160—168), though the largest of all from Celebes (wing 169) has no such bristles.

Skeleton.

Length of cranium	63.0 mm	Length of tibia	46.0 mm
Greatest breadth of cranium .	26.0 »	Length of tarso-metatarsus . .	25.0 »
Length of humerus	37.5 »	Length of sternum	35.8 »
Length of ulna	50.0 »	Greatest breadth of sternum .	29.0 »
Length of radius	44.0 »	Height of crista sterni . . .	9.5 »
Length of manus	42.0 »	Length of pelvis	40.2 »
Length of femur	29.4 »	Greatest breadth of pelvis . .	24.0 »

Eggs. "Dr. Platen sent me a clutch of 2 eggs of this bird from Rurukan in the Minahassa, measuring 33×21 mm, and like most of the members of the genus much elongated. The ground-colour is white, marked with only isolated underlying spots — some very small, others very large — of pale violet, and with superjacent spots — some light red, others dark brown, which unite into a circlet at the blunt end. The shell has little or no gloss" (Nehrkorn MS.).

Two eggs (one broken) in the Sarasin Coll., accompanying a nest, differ considerably from Mr. Nehrkorn's description; they are white in ground-colour, finely peppered all over with shell-spots of pale lilac and surface-spots of a browner tint, none of the spots larger than an ordinary pin's head and most of them minute points only, slightly more conglomerated towards the blunt end of the egg: broad oval — 29×21 mm (Tomohon, 19. April 1894).

Nest. The Sarasins obtained two nests: one with the above two eggs, the other containing a nestling ("there were probably two"). They are broad, deep saucers: internal diam. c. 90 mm, depth c. 40 mm, lightly built of vegetable fibres and roots, with a few bits of sticks intermingled in the base and sides, lined with finer dark root-fibres. The structure is cleverly suspended between the prongs of a forked branch.

Dr. Platen writes *(d 6)*: "I found the nest twice on a bough stretching across a busy road at a height of 4—5 meters, where it was suspended in a fork after the manner of building of the Orioles".

Distribution. The *typical Dicrurus leucops* — Celebes and the islands off the coast: Minahassa (Wallace *a 1*, etc.); between Minahassa and Popo Mongondo (P. & F. Sarasin *a 10*); Gorontalo District (Meyer *a 7*); Manado tua, Lembeh, Mantehage and Banka (Nat. Coll.), Talissi (Hickson *c 3*); Togian Is. (Meyer *a 7*); E. Celebes (Nat. Coll.); Kandari, S. E. Peninsula (Beccari *a 4*); W. Celebes (Doherty *a 14*); S. Peninsula (Wallace *a 3*, *c 1*, Meyer *a 7*, etc.); Tempe, and Luwn at the head of the Gulf of Boni (Weber *c 4*); Saleyer Id. (Everett *a 13*).

Dicrurus leucops—axillaris (Wall., Salvad.): Siao (Meyer *d 1*, Platen *d 7*, Nat. Coll.), Biarro, Gunong api and Tagulandang (Nat. Coll.).

2. Dicrurus leucops axillaris (Salvad.).

e. **Dicruropsis leucops** pt. *(1)* Sharpe, Mitth. Mus. Dresden 1878, III, 361; Meyer, l. c. note; *(2)* W. Blas., Ztschr. ges. Orn. 1885, 283.

f. **Dicruropsis axillaris** *(1)* Salvad., Atti Ac. Sc. Tor. XIII, 1878, 1184; *(2)* Meyer, Isis Dresden 1884, 6, 31; *(3)* W. Blas., Ornis 1888, 582.

"Gating tahiti", Great Sangi, Nat. Coll.

Description. Salvadori *f 1.*

Adult. Not differing from the adult of Celebes, except that the axillaries and under wing-coverts are more broadly tipped with white (N. B. in one of our 3 adults, C 12683, this is not the case).

Immature. A younger specimen has fewer metallic tips to the feathers of the breast and a few of the feathers of the lower breast and abdomen tipped with whitish cinnamon; the under wing-coverts and axillaries more broadly tipped with white than in the adult (Great Sangi, C 1177).

Measurements. Wing (3 adults) 162—170 mm; tail 137—144; bill from nostril 21.5—26; tarsus 25.

Distribution. Great Sangi (Meyer *e 1*, Bruijn *f 1*, Platen *f 3*, Nat. Coll. in Dresd. and Tring Mus.).

Dicrurus leucops is a very bold and familiar bird in Celebes. Its cries are highly varied, one individual, observes Meyer *(a 7)*, making such a noise in the morning that the forest appears to be full of various birds. In flight as Dr. Hickson *(c 3)* remarks, it has the habit of opening and shutting its two long outer tail-feathers like a pair of scissors in action. It feeds on insects, such as grasshoppers, etc. *(a 7)*.

The Celebes Drongo may be distinguished from its allies in the East Indies by its milk-white iris; in the other species it is red or brown. In this connection the Sarasins made a discovery of some interest; they found that the iris is also brown in the young of the Celebes Drongo. This was proved in a series of seven specimens, from the nestling to the immature individual, while in the adults they found it always to be white. This seems to prove that the Celebes species is descended from a race with brown eyes. *D. leucops* is most nearly related to *D. pectoralis* Wall. of the Sula Islands and to the numerous forms of that species — which have for the most part been separated as specifically distinct — from Obi, Borneo, Palawan, Sooloo, New Britain, and the D'Entrecasteaux Islands. Count Salvadori (P. Z. S. 1878, 88) lays some stress upon the presence in *C. pectoralis* of long recurved hairs sprouting from the forehead; these, however, as pointed out *antea*, are also found in old examples — perhaps old males, or males in breeding-dress — of *D. leucops*, as also in *D. borneensis* described by Sharpe in 1879. In *Dicrurus hottentottus* (L.) of Indo-China the hairs are developed to such an extent as to form a sort of crest.

These hairs, remarks Lord Tweeddale (Ibis 1868, 73), "are really the denuded shafts of a certain number of the frontal plumes. Under a lens the aborted rudiments of the lateral webs can be readily detected. Behind these denuded shafts are usually (in *D. hottentottus*) a number of elongated frontal

crest-plumes in different states of perfection". The imperfect and irregular development of these fine naked shafts in at least three East Indian species, when adult or even old, seems to suggest that this character is becoming obliterated, in other words, that these hairs are ancestral vestiges derived from a form like *Dicrurus hottentottus* of Indo-China.

In the closely-allied genera, *Bhringa* and *Dissemurus*, one of the most wonderful developments of racket tail-feathers is seen, the outermost pair of rectrices being greatly prolonged, bare-shafted for some distance from the point where they overreach the other tail-feathers, each ending with a long and broad paddle-like racket. In *Bhringa* the shaft passes mesially through the racket, in *Dissemurus* the inner web of the racket is very much reduced, but the outer web very broad. (See, also, remarks on *Prioniturus platurus* and *Merops ornatus* in the Introduction.)

The white tips on the axillaries and under wing-coverts, which are best developed in Sangi birds, are sometimes absent in adults from the mainland, while younger Celebes specimens possess them sometimes to as great an extent as those of Siao, or even as adults from Great Sangi. But that they tend to disappear with age in Celebes shows that the birds of the mainland are more advanced in development in this respect.

The size and extent of the spots on the breast and throat are dependent upon the age of the individual. This has perhaps not always been taken sufficiently into consideration by writers on the next species, *D. pectoralis* Wall.

169. DICRURUS PECTORALIS Wall.

Sula Drongo.

Dicrurus pectoralis *(1)* Wall., P. Z. S. 1862, 342; *(2)* Finsch, Neu Guinea 1865, 170 pt. (Sula); *(3)* Gray, HL. 1869, I, 285, Nr. 4214; *(4)* Wald., Tr. Z. S. 1872, VIII, 70; *(5)* Sclat., P. Z. S. 1877, 101; *(6)* Salvad., ib. 1878, 88; *(7)* Tweedd., t. c. 615; *(8)* id., Ibis 1878, 73; *(8bis)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 2, p. 15.

a. **Chibia pectoralis** *(1)* Sharpe, Cat. B. III, 1877, 240; *(2)* id., P. Z. S. 1879, 247.

b. **Dicruropsis pectoralis** *(1)* Salvad., Ann. Mus. Civ. Gen. 1879, XV, 39; *(2)* id., Orn. Pap. II, 1881, 173 (Obi major); *(3)* Guillem., P. Z. S. 1885, 571.

"Sumpolak", Peling and Banggai, Nat. Coll.

Adult. Like *D. leucops* Wall. of Celebes, except as regards the iris, which is red, not white.

Observation. Other differences, such as smaller size and more brilliant spangles on the breast, as mentioned by Sharpe *(a 1)*, and the presence of long recurved hairs sprouting at the forehead, on which Salvadori has laid stress, cannot be admitted as discriminative characters for this form, since our large series of *D. leucops* shows that species to be highly variable as regards size, extent and tint of the metallic spangles, and the presence and length of the fine hair-like recurved shafts at the forehead, the differences being in a large measure due to age and to some extent, we believe, to sex and season. Dr. Guillemard *(b 3)* seems first to have pointed out that the recurved filaments are absent in many specimens of *D. pectoralis* (from where?), with which he identifies the Sooloo bird, and Mr. Wallace makes no mention of them in his diagnosis of the species, though they are present in the type *(a 1)*.

Measurements. Seven adults from Peling and Banggai have the wing 150—164 mm.
Distribution. Sula Islands (Allen *1, a 1*); Peling and Banggai *(8bis)*; Obi major (Bruijn *b 2*).

The Sula Drongo is one of a closely interrelated group of red-eyed species consisting of itself, *D. borneensis* (Sharpe) from Borneo and Sooloo, *D. palawanensis* Tweedd. from Palawan, *D. laemostictus* Sclat. from New Britain, *D. propinquus* (Tristr.), D'Entrecasteaux Islands, *D. bracteatus* Gould, Australia, S. New Guinea and the Tenimber Group, *D. atrocaeruleus* Gr. of Halmahera and Batjan — wrongly recorded also by Gray and copied by Rosenberg as from Celebes (HL. I, 285; Mal. Arch. 272) — and *D. carbonarius* Bp. of Papuasia. To these *D. biwaensis* Bp. of Lombok, Sumbawa, Sumba and Flores — also wrongly recorded by Gray and copied by Rosenberg as from Celebes — and *D. sumatranus* R. G. W. Rams. of Sumatra again stand very near. This is one of those cases where names have been given and the birds of certain places marked off in a manner not calculated to advance knowledge in ornithology; it is only after looking up the matter with considerable loss of time that the student becomes aware what an intricately interconnected set of local races these numerous specific names really represent. In most cases we may presuppose that some differences really exist, but whether these have always been correctly discriminated by the authors the future must show. The green and blue tints and the size of the metallic spots on the breast undoubtedly vary, as already mentioned, with age. Most of the forms may be expected, as subspecies, to fall into the ranks of one species, *D. carbonaria* Bp. In plumage there seems to be no difference between the Peling and Banggai birds and those of Celebes *(D. leucops)* and, in labelling the specimens from E. Celebes *D. leucops* and those of Peling, *D. pectoralis*, we are compelled to act from mere guess-work, for all that can be said is that it is probable that the latter will follow the rule and have the iris of the same colour as the Sula birds, and not as in the adult Celebes birds.

FAMILY DICAEIDAE.

The Flower-peckers are among the smallest birds occurring in Celebes. Oates has stated that they may be separated at once from all other *Passeres*, except the *Nectariniidae*, by the serrated edges of both mandibles.[1]) In the *Dicaeidae* the bill is as long as the head or less, in the *Nectariniidae* it is longer than the head, slender, and decurved. The nostril of the *Dicaeidae* is long and narrow, with an imperfect coriaceous operculum above; the tail is short, about half as long as the wing; in some cases there are nine primaries only, the outermost one being nearly as long as the longest, in other genera a small tenth primary is still present. The more typical genera are Indo-Australian.

[1]) The tomia are roughly serrated in many of the *Meliphagidae*.

GENUS DICAEUM Cuv.

Nine primaries; bill as long as the cranium, tapering and pointed, broad at the base; tarsus stout, longer than the toes, the hallux about as long as the middle toe. Sexes dissimilar, the males more or less glossy and resplendent, the females plain, the young much like the females. Nest suspended from a twig, pear-shaped, the entrance at the side; eggs white.

The genus belongs to the Indo-Australian area.

Two genera of *Dicaeidae* are found in the Celebesian area. *Dicaeum* itself ranges from India and South China to Australia, where only one species occurs, while about seven are found in British India. There are seven in Celebes and the neighbouring islands, belonging to 2 or 3 well marked divisions of the genus. Four are local forms closely related to one another and to a species inhabiting Kini Balu Mountain, Borneo, a second form *(D. nehrkorni)* is apparently intermediate between a group ranging from the Great Sunda Islands to India and S. China and a group found in New Guinea; a third form *(D. splendidum)* has its nearest affinities in the Timor group. It is doubtful whether the species have anything to say on the former disposition of land and water about Celebes.

Acmonorhynchus, a genus occurring interruptedly in Ceylon, one of the Philippines, Great Sangi, Celebes and Flores, displays some indications of descent from *Pachyglossa* of the Himalayas, a form which seems to have emigrated and reached the Celebes area and Flores at some distant period, Ceylon more recently.

* 170. DICAEUM CELEBICUM S. Müll.

Celebes Red-throated Flower-pecker.

Plate XXV.

Dicaeum celebicum *(1)* S. Müll., Verh. Natuurk. Comm. 1839—44, 162; *(2)* Gray, Gen. B. 1847, I, 100; *(3)* Bp., Consp. I, 1850, 403; *(4)* Reichb., Hb. Scansoriae 1853, 240; *(5)* Wall., P. Z. S. 1862, 342, pt. (Celebes); *(6)* Finsch, Neu Guinea 1865, 163 pt. (Celebes); *(7)* Gray, HL. I, 1869, 115, Nr. 1422; *(8)* Wald., Tr. Z. S. 1872, VIII, 72 pt. (Celebes); *(9)* Salvad., Ann. Mus. Civ. Gen. 1875, 661; *(10)* Brüggem., Abh. Ver. Bremen 1876, 74; *(11)* Rosenb., Malay. Archip. 1878, 272; *(12)* Meyer, Ibis 1879, 132, 146; *(13)* W. Blas., J. f. O. 1883, 138; *(14)* Sharpe, P. Z. S. 1883, 578; *(15)* id., Cat. B. X, 1885, 23; *(15bis)* Guillem., P. Z. S. 1885, 554; *(16)* W. Blas., Ztschr. ges. Orn. 1885, 291; *(17)* Sharpe, Ibis 1889, 428; *(18)* Heine & Rchw., Nomencl. Mus. Hein. 1890, 61; *(19)* Büttik., Zool. Erg. Weber's Reise Ost-Ind. 1893, III, 279; *(20)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 10; *(21)* iid., ib. 1896, Nr. 1, p. 5; *(22)* Hart., Nov. Zool. 1896, 151; *(23)* id., ib. 1897, 155.

a. **Dicaeum leclancheri** *(1)* Lafr., Rev. Zool. 1845, 94; 1846, 42; *(2)* Hartl., ib. 1846, 4, 47, 111.

"Burung tjui dada mera", Malay name, Minahassa, Nat. Coll.

Descriptions. S. Müller *1*; Reichenbach *4*; Sharpe *15*; W. Blasius *16*.

Adult male. Above purplish steel blue-black; quills and sides of head more dusky; submalar region concolorous with head; chin, throat and jugulum scarlet; sides of body dusky grey, washed with olivaceous; lower breast, abdomen and under tail-coverts ochraceous buff, a broad mesial stripe of blackish on breast, the under tail-coverts with blackish central streaks; under wing-coverts and axillaries white; edge of wing black; inner edging of quills below pale (♂, Macassar, 3. X. 95: Sarasin Coll.). Iris brown; bill, feet and claws black (Meyer *12*, Platen *16*).

Young male. Without the scarlet throat: above greyish seal-brown, washed with bistre on the rump; breast and sides paler and more olivaceous grey; throat, abdomen and under tail-coverts yellowish white; under wing-coverts and axillaries white, edge of wing freckled with dusky; quills and tail blackish (Macassar, ♂, Jan. 1873, Meyer — C 442). Bill reddish yellow *(12)*.

Variation. The scarlet tint of the throat varies in intensity. With age the grey on the sides and breast seems to grow blacker and to become more extended over the surface. Two males from Macassar (C 440, C 441), killed in January and perhaps not quite fully adult, have the black on the under surface much less in extent than in a specimen from Banka (May) and a second from Manado tua (April) — islands off the coast of N. Celebes. The gloss on the upper surface is sometimes pre-eminently steel-blue, occasionally more coppery (Banka Id.); between such birds gradual transitions are found.

One or two specimens from the Minahassa, apparently fine old adult males, have the broad black stripe along the middle of the breast glossed with the steel-blue of the upper surface.

Female. Above dark brownish slaty glossed with lilac; upper tail-coverts and tail blue-black, as in the male; below buff, olive-green on the sides and flanks, olive-grey on the sides of the breast, darker on the face. Size smaller than the male: wing 45 mm. (♀, Rurukan, N. Cel., 2. XI. 94: Sarasin Coll.)

Measurements.	Wing	Tail	Bill from ant. nostr.	Tarsus
a. (Nr. 7698) ad., N. Celebes	50	26	7	11.3
b. (C 435) ad., Manado, III. 71	47	26	7	11
c. (C 436) ad., Manado, III. 71	49	24	—	11.5
d. (C 12210) ad., Manado tua, 16. IV. 93	48	24	6.5	12
e. (C 12209) ad., Banka, 11. V. 93	48	25	6.5	11.5
f. (C 441) vix ad. ♂, Macassar, I. 73	48	23	6	—
g. (C 440) vix ad. ♂, Macassar, I. 73	49	26	7	11.5
h. (Nr. 7699) imm., Celebes	47	24	6.5	—
i. (C 442) juv. ♂, Macassar, I. 73	44	21	6.5	11

7 additional specimens (6 Sarasin Coll.) from N. & S. Celebes do not overreach these measurements (as to the wing).

Eggs. "The eggs sent by Dr. Platen from Rurukan in the Minahassa are pure white, like the eggs of all species of *Dicaeum*, and measure 13 × 10 mm" (Nehrkorn MS.).

Distribution. Celebes and the islands off the coast: Minahassa (Leclancher *a 1*, Wall. *15*, etc.); Lembeh, Banka and Manado tua Is. (Nat. Coll.); Togian Islands (Meyer *12*); W. Celebes (Doherty *23*); Southern Peninsula (Wallace *15*, Meyer *12*, Platen *16*, Weber *19*, etc.).

This Flower-pecker seems to be a rather plentiful little bird in North Celebes, inhabiting both the country near the coast, such as the neighbourhood

of Manado where Meyer met with it from January to July, and the hills behind, where it was found by Dr. Guillemard at Tondano and Tomohon, over 2000 feet, and by Dr. Platen at Rurukan, over 3000 feet, and later in the same neighbourhood by the Sarasins. In the south it is known from the coast at Macassar up to 4000 ft. on Mt. Bonthain (Sarasins).

The members of the genus *Dicaeum*, as Oates writes (Faun. Brit. Ind. Birds II, 375), "frequent trees, generally at a considerable height above the ground, and feed both on insects and small berries. Their nests are beautiful structures made of the finest and most delicate materials, egg-shaped, and suspended from the tip of a branch". The genus is a large one; in 1885 (Cat. B. X, 10—48) Dr. Sharpe described 47 species which range from India and South China throughout the East Indies to Australia and Tasmania, and a number of new species have since been found in the East Indies, where the list is still, apparently, far from complete. Dr. Sharpe enumerates 9 species from the Asiatic continent and islands off the coast, 10 — three of them found also on the continent — from the Great and Lesser Sunda Islands, not counting the Celebes Province where seven species are now (Nov. 1897) known, 10 from the Philippines, 4 from the Moluccas, 14 from the Papuan Islands, and only one from Australia and Tasmania. Thus, Australia is rendered highly improbable as the land of origin of the genus. As a rule, few forms are found in one and the same locality, seven recorded by Oates from British India, five by Everett from Borneo, and five by Salvadori from New Guinea being the maximum numbers. The species inhabiting the Philippines, now numbering with Sooloo 13, are mostly insular forms. It is very difficult to form an opinion as to their value in determining former geographical conditions; minute stationary birds like these have often such very restricted ranges that one is almost tempted to say that the smaller the bird the narrower its range, and that if these species are to be taken as a criterion for the former disposition of land and water in the East Indies, then many bigger, wider-ranging birds cannot be taken into account and must be held to have spread their range by flight; in point of fact, however, many large birds are more local than these species of *Dicaeum*, some of which are of wider range, two following the familiar rule of having Borneo, Sumatra and S. E. Asia for their habitat.

* 171. DICAEUM SULAENSE Sharpe.

Sula Red-throated Flower-pecker.

a. **Dicaeum celebicum** partim *(1)* Wall., P. Z. S. 1862, 342 (Sula); *(2)* Finsch, Neu Guinea 1865, 163 (Sula); *(3)* Wald., Tr. Z. S. 1872, VIII, 72 (Sula).

Dicaeum sulaense *(1)* Sharpe, P. Z. S. 1883, 579; *(2)* id., Cat. B. X, 1885, 24; *(3)* W. Blas., Ztschr. ges. Orn. 1885, 292; *(4)* Rchnw. & Schalow, J. f. O. 1886, 437; *(5)* Sharpe, Ibis 1889, 428; *(6)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 2, p. 10.

„Tomosi caposes", Banggai Id., Nat. Coll.

Description. Sharpe *2*.

Diagnosis. Like *D. celebicum*, but the sides of the body olivaceous green, instead of dusky grey with a wash of olive; the flanks brighter with a yellowish olive wash. The violet gloss on the upper parts seems to be duller ([♂] Banggai Id., V.—VIII. 95: C 14666).

The fresh skins from Banggai struck us as having a much more violet upper surface than *D. celebicum*. It is perhaps not quite correct to say it is violet, but there is decidedly a difference of tint.

Young. Olivaceous green above, as against grey olive in *D. celebicum* juv., wing-coverts and quills edged with the same colour; below chiefly buff-whitish, becoming yellowish olive as in the adult male on the flanks, face and sides of breast greyer (Banggai, C 14669).

Measurements. Wing 47 (juv. ♀ ?), 51—53 mm (♂ ad.); tail ca. 29; tarsus ca. 12; bill from nostril ca. 7.

Distribution. Sula Islands (Allen *a 1, 2*); Banggai Id. (Nat. Coll. *6*).

The type-specimen of these species was obtained by Wallace's assistant, Allen, in Sula Besi or Sula Mangoli; it is in the British Museum, and remained the only example on record until the end of 1895, when a small series from Banggai obtained by our native hunters reached the Dresden Museum; some of them are now in the Tring Museum.

Dr. Sharpe mentions its close affinity to *D. monticola* of Kini Balu, Borneo, a species which may be distinguished from *D. celebicum* by its olive-green flanks, and from both *D. celebicum* and *sulaense* by its steel-blue-black back. *D. sangirense* and *talautense* also stand near, but have grey sides.

* 172. DICAEUM SANGIRENSE Salvad.

Sangi Red-throated Flower-pecker.

Plate XXV.

Dicaeum sanghirense *(1)* Salvad., Ann. Mus. Civ. Gen. IX, 1876, 58; *(2)* Meyer, Isis, Dresden 1884, 6; *(3)* Sharpe, P. Z. S. 1883, 579; *(4)* id., Cat. B. X, 1885, 24; *(5)* W. Blas., Ztschr. ges. Orn. 1885, 292; *(6)* id., Ornis 1888, 590; *(7)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 9, p. 5.

Descriptions. Salvadori *1*; Sharpe *4*; W. Blasius *6* (young male and measurements).

Adult [male]. Above, including face and submalar region, metallic hyacinth-blue-black, quills and ear-coverts dusky; chin whitish; throat and jugulum scarlet; sides smoky slate-grey, darkest on sides of neck; abdomen, middle of breast and under tail-coverts white, the last with some central streaks or spots of grey; under wing-coverts and axillaries white; metacarpal edge blackish; bill black, base of lower mandible whitish; legs and feet blackish (Great Sangi [♂ according to the hunter's mark] — C 1050).

Immature. A younger specimen has the upper plumage mixed, old feathers of slate-grey and new ones of metallic blue-black like the adult, the blue-black being predominant on the forehead, mantle, and scapulars, the grey on the neck, lower back and greater wing-coverts; on the crown, other wing-coverts and upper tail-coverts the grey and blue-black feathers are a good deal mixed. The scarlet of the throat less extended and less brilliant than in the adult; the middle of breast and abdomen washed with fulvous (Great Sangi [♂ according to the hunters' mark] — C 515).

Young male. Not a trace of red on throat and breast; under surface grey, with greenish yellow intermixed; above uniform dark grey; tail and wing-feathers with some metallic gloss (W. Blasius *6*).

Female. A female is described by Salvadori as follows: above ashy bluish, slightly glossy; wings, upper tail-coverts and tail darker, nearly black; middle of under surface from chin to crissum whitish, slightly yellowish, sides of body greyish slightly olivescent; under tail-coverts white, dusky in the middle.

Prof. W. Blasius informs us that this description of the female does not correspond with the two females sent by Dr. Platen from Great Sangi. "*Dicaeum sanghirense* ♀ ad. and ♂ ad. are distinguishable from one another in very inappreciable respects only, judging from the examples collected by Platen and submitted to me. The description of a female by Salvadori seems to me also to have reference to a young example" (in lit.).

Measurements.	Wing	Tail	Bill from nostril	Tarsus
a. (C 1050) [♂] ad., Tabukan, Gt. Sangi	49	28	6	12
b. (C 515) [♂] imm., Tabukan, Gt. Sangi	50	28	6	12

The smallest and largest specimens of 11 adults recorded by W. Blasius differ as follows: wing 47, 51; tail 27, 29; culmen 9, 9 (in two others 9.5); tarsus 11, 12.

Distribution. Great Sangi (Bruijn *1*, Meyer in Dresd. Mus., Platen *6*).

The *Dicaeum* of Sangi has its nearest known affinities in *D. talautense*, *celebicum* and *sulaense*. It may be distinguished, as Count Salvadori has shown, from *D. celebicum* by the glossy blue black, not blackish violaceous, of its upper surface, and by its white belly and under tail-coverts, the former scarcely tinged with yellow. From *D. sulaense* it is separable, as Dr. Sharpe shows, by its ashy, not olive, sides. It is smaller than *D. talautense*, and has the sides less dark grey, the flanks whitish.

D. sangirense, *celebicum*, *talautense* and *sulaense*, of the Celebes Province form with *D. monticola* Sharpe of Kini Balu, Borneo, a very closely connected little group. Rather further removed are *Dicaeum hirundinaceum* (Shaw & Nodder) of Australia, and its allies, and *D. sanguinolentum* Temm. of Java, and the female of the latter has the peculiarity of having the upper tail-coverts scarlet. Another section, consisting of *D. mackloti* M. & S. of Timor and *D. salvadorii* Meyer of Babbar Island between Timor and Timorlaut, and *D. splendidum* Büttik. of Saleyer, Djampea and ? S. Celebes have the rump and upper tail-coverts scarlet in the male, and in the first and last species (the female of *D. salvadorii* is not yet known) in the female also. If the female of *D. sanguinolentum* be supposed to display a lower stage than the male in the evolution of the race, this species should formerly have resembled *D. mackloti*.

173. DICAEUM TALAUTENSE M. & Wg.

Talaut Red-throated Flower-pecker.

Dicaeum talautense *(1)* M. & Wg., Abh. Mus. Dresden 1895, Nr. 9, p. 5.
"Tete marundang" or **"Tete apiapi"**, Karkellang, Nat. Coll.

Adult male. Like *D. sangirense* ♂, but larger; breast and sides of body dusky olive-slate-grey, a stripe of glossy violet-black down the middle of the breast (in fully adult birds only); abdomen yellowish white, flanks olive-slate-grey; under tail-coverts white, with broad olive-black centres (Karkellang, Talaut, autumn, 1896, C 15371).

Female? Above olive-slate-grey, with a slight gloss of violet on the mantle and head, a wash of yellowish on the rump; wings and tail black, glossed with violet, the wings with edgings to the feathers of the colour of the back; under parts chiefly yellowish olivaceous, greyer on sides of breast and face, along the mesial region of the throat and body pale yellowish; under wing-coverts white with some darker shaft-streaks (Karkellang, C 15374).

Young [male]. The basal half of the bill yellow; like the female, but the entire under parts yellowish olivaceous, except a little yellowish on the abdomen, and no violet gloss on the head or mantle (Karkellang: C 15372).

Measurements. Wing (females) 48—50 mm; (males) 51—56; tail ca. 27—28; tarsus ca. 13; bill from nostril ca. 7—7.5.

Distribution. Talaut Islands — Karkellang (Nat. Coll.).

This species is known only from the largest island of the Talaut group, where a small series was obtained by our native hunters in November, 1893, and a very good series in autumn, 1896. As a rule the geographical races of Sangi are slightly larger than those of Talaut, but in the present case this condition is reversed, for *D. talautense* is a little larger than *D. sangirense*, and it is also more darkly coloured, as are indeed *Oriolus melanisticus*, *Pitta inspeculata* and *Edolïsoma talautense* of Talaut.

* 174. DICAEUM SPLENDIDUM Bütt.

Saleyer Flower-pecker.

Dicaeum splendidum *(1)* Büttik., Notes Leyden Mus. 1893, XV, 180; *(2)* Hart., Nov. Zool. 1896, 167, 182, 256.

Adult male. Entire head, hind neck and sides of neck, mantle, back and wing-coverts steel-blue-black, the latter somewhat glossed with purplish; rump and upper tail-coverts scarlet; tail-feathers glossy steel-blue; chin white; throat and fore-neck scarlet, encircled by a dull black stripe, beginning as a moustachial streak, running down along the sides of the neck and forming a rather broad black band across the chest, continued along the middle of the breast as a black stripe; breast, flanks, abdomen, thighs, under tail-coverts and under wing-coverts creamy-white; edge of wing dull black; bill and feet black (Büttikofer). Wing 52 mm; tail 27; tarsus 18; culmen 9 (Büttik. *1*).

"Iris dark brown; bill black; mandible grey, palest at base; feet and claws very dark grey, almost black" (Everett *2*).

Female. Above slaty olive; wings dusky glossed with bluish and edged with the colour of the upper parts; rump and upper tail-coverts impure flame-scarlet; below creamy white, grey on sides of breast, passing into the colour of the upper parts on sides of neck and face; under wing-coverts white, rectrices blackish; "basal portion of maxilla and two-thirds of mandible dull orange": Everett (♀, Djampea Id., Dec. 1895: Everett — C 14877).

Measurements.	Wing	Tail	Tarsus	Bill from nostril
a. (C 14878) ♂ Djampea (Ev.)	54	27	13	6.5
b. (C 14877) ♀ Djampea (Ev.)	49	27	12.5	6

Distribution. Djampea and Saleyer (Everett *2*); ? Macassar District, South Celebes (Teijsmann *1*).

This species, with *D. mackloti* M. & S. of Timor and *D. salvadorii* Meyer of Babbar, forms a section of the genus *Dicaeum* in which the rump and upper tail-coverts are scarlet. Mr. Büttikofer remarks that *D. mackloti* may be considered its nearest ally, from which it differs in its smaller size and in the upper surface having a steel-blue instead of a well pronounced purplish gloss. *D. salvadorii* is even larger than *D. mackloti* (cf. Meyer, Isis, Dresden 1884, 38). Mr. Hartert finds the principal differences from *D. mackloti* to be: "the colour of throat, which is lighter, more vermilion, and extends farther down on the breast, and the greatly diminished dark surroundings of the red throat. They are broad and deep black in *D. mackloti*, while they are blackish grey and narrow in *D. splendidum*. The colour of the back varies, and is not constantly different in the two species".

The type of the species was included in the collections of the botanist Teijsmann, and is indicated as having come from the District of Macassar. The discovery of the bird in Djampea and Saleyer by Everett renders it more probable that Teijsmann's specimen really came from the latter island which was visited by the traveller from Nov. 16. to Dec. 12., 1877 (Nat. Tijdschr. Ned. Ind. XXXVIII, 111—119).

* 175. DICAEUM NEHRKORNI W. Blas.

Scarlet-capped Flower-pecker.

Plate XXV.

Dicaeum nehrkorni *(1)* W. Blas., "Braunschweigische Anzeigen" (newspaper!), 3. März, 1866; *(2)* Schalow, J. f. O. 1886, 399; *(3)* Platen, Gefied. Welt 1887, 206; *(4)* M. & Wg., Abh. Mus. Dresden 1895, Nr. 8, p. 10; *(5)* Hart., Nov. Zool. 1896, 151; *(6)* id., ib. 1897, 155.

Description. Hartert *5*.

Adult male. A cap extending from forehead to occiput flame-scarlet, narrowly bordered with black; rump scarlet like the crown; sides of head and neck sooty brown, passing into black glossed with violet on the mantle, scapulars, wing-coverts, tail and upper tail-coverts; quills dusky; throat and ear-coverts drab; breast smoky brown, varied with whitish, and with about three feathers in it tipped with flame-scarlet; sides and flanks lighter brown than the breast and enclosing a narrow space of white down the middle of the abdomen; under wing- and tail-coverts white; metacarpal edge dark brown, with light tips to the feathers. Wing 46 mm; tail 23; tarsus 12; bill from feathers of forehead 9 (type, ♂, Rurukan, Minahassa, 6. VIII. 84; Platen in Mus. Nehrkorn, Nr. 976).

Iris brown; bill and feet black (Platen).

Adult female. Above dark olive-slaty, tinged with brighter brown on the head; rump flame-scarlet like the male, tail a little duller; below whitish, sides of head and neck, sides, flanks, and a mesial stripe on the body below olive-grey, blending, where it meets, with the darker hue of the upper surface (♀, Indrulaman, S. Cel., Everett, C 14914).

"Iris brown; bill black, base of mandible paler; feet bluish grey; claws blackish"(Ev. *5*).

Young. Above like the adult female, but without scarlet on the rump — here olivaceous; below olive-grey, a greenish tinge on the flanks, only the mesial region yellowish white; gape and basal half of lower mandible yellowish (♀ juv., Loka, S. Cel., P. & F. S.).

Measurements (6 adult males). Wing 46—53 mm; tail ca. 23; tarsus ca. 12; bill from nostril ca 6—8; (2 females) wing 44,45 mm.

Variation. Males from North and South Celebes do not seem to differ in size, though varying individually. The scarlet cap is lighter in some specimens than in others, but this difference also is not bound to the geographical locality.

Distribution. Celebes: North Peninsula — Rurukan (Platen *1*, *3*, P. & F. Sarasin *4*); South Peninsula — Peak of Bonthain and the neighbouring hill-country (Everett *5*, P. & F. Sarasin, Doherty *6*).

This pretty Flower-pecker will probably prove to be an inhabitant of all the mountain districts of Celebes, since it is now known from the hills of the extreme north and south at heights of about 2000—6000 feet.

We are indebted to Mr. Nehrkorn for the loan of the type of this species, which prior to 1894 was the only specimen on record[1]). It was found by Dr. Platen in company with *D. celebicum* among the orange and citron plantations of the mountain-village of Rurukan.

The bird seems to belong to a well-marked species, intermediate between the *cruentatum*-group of India and South China to the Great Sunda Islands, from which it may be distinguished by its black, not scarlet, back and scarlet on throat, and the *rubrocoronatum*-group of New Guinea, from which it is separable by its violet-black upper and white under tail-coverts. The small size of the scarlet spot on the throat is likely to give the impression that the bird is immature, but this spot never seems to attain to a larger size.

* 176. DICAEUM HOSEI Sharpe.

Hose's Flower-pecker.

Dicaeum hosei Sharpe, Bull. Br. Orn. Club Nr. XLV, p. XLVIII and Ibis 1897, p. 449.

Adult. Back in continuation with the head, rump and upper tail-coverts red, a shade deeper than in *D. nehrkorni*, the black bases of the feathers on the back showing through; lores, superciliary region, face, chin, upper throat, sides of neck and of breast sooty black, becoming greyer and greener on the flanks; lower throat, mesial part of breast, abdomen and under tail-coverts buff; wings and tail above glossy blue-black; under wing-coverts pure white (♂, type, Mt. Masarang, N. Celebes: 4000 feet, October 1895: Hose).

1) After this had gone to the press we learn from Prof. W. Blasius' "Neuer Beitrag z. K. Vogelf. Cel." (rec. Sept. 30th 1897) that Platen obtained five specimens, 3♂♂, 2♀♀.

Measurements. Wing 46 mm; tail 22; tarsus 11; bill from nostril 7.
Distribution. Minahassa, Celebes — Mt. Masarang (Hose).

This new species is easily distinguishable from *D. nehrkorni* by its back being red like the rump and top of the head, by the sooty black (instead of grey-brown) of the face, chin and sides of neck and breast, and the buff of the middle parts below.

GENUS ACMONORHYNCHUS Oates.

These little birds have nine primaries like *Dicaeum*, but the bill is not so long as the cranium, and very much stronger than in *Dicaeum*, across the nostril as high as it is broad; there are also no metallic tints in the plumage. It is known from Ceylon, the Philippines, Sangi, Celebes, and Flores.

* 177. ACMONORHYNCHUS AUREOLIMBATUS (Wall.).

Yellow-sided Flower-pecker.

a. **Prionochilus aureolimbatus** *(1)* Wall., P. Z. S. 1865, 477, pl. XXIX, fig. 1; *(2)* Salvad., Atti Ac. Sc. Torino 1868, 420; *(3)* Wald., Tr. Z. S. 1872, VIII, 72; *(4)* Sclat., Ibis 1874, 2; *(5)* Wall., Ibis 1874, 411; *(6)* Salvad., Ann. Mus. Civ. Gen. 1875, 661; *(7)* Brügg., Abh. Ver. Bremen 1876, V, 74; *(8)* Salvad., Ann. Mus. Civ. Gen. X, 1876, 59; *(9)* Meyer, Ibis 1879, 132; *(10)* W. Blas., J. f. O. 1883, 138; *(11)* Sharpe, Cat. B. X, 1885, 70; *(12)* Guillem., P. Z. S. 1885, 555; *(13)* W. Blas., Ornis 1888, 592.

b. **Dicaeum aureolimbatum** *(1)* Gray, HL. I, 1869, 116, Nr. 1442; *(2)* Rosenb., Malay. Archip. 1878, 272.

c. **Pachyglossa aureolimbata** *(1)* Wall. in Legge's B. Ceylon 1880, 577; *(2)* id., Island Life 1880, 433.

Acmonorhynchus aureolimbatus *(1)* Büttik., Zool. Erg. Weber's Reise in Ost-Ind. 1893, III, 303; *(2)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 10; *(3)* iid., ib. 1896, Nr. 1, p. 11; *(4)* Hart., Nov. Zool. 1896, 151; *(5)* id., ib. 1897, 155, 161.

"Burong tjui dada mera", Banka Island, Minahassa, Nat. Coll. The bird seems to be regarded by the natives as the female of *Dicaeum celebicum*!

Figure and descriptions. Wallace *I*; Salvadori *a 2*; Sharpe *a 11*.

Skeleton. On the skull (of a specimen coll. by M.) see Parker, Tr. Z. S., X, 1878, 254.

Adult male. Above yellow-olive-green, most strongly washed with yellow on the lower back; wings and tail black; the innermost quills and smaller wing-coverts margined with olive-green; a mark from the lores to below the ear-coverts slate-colour; chin, throat and jugulum greyish white; sides of breast, sides, flanks and under tail-coverts gamboge-yellow, a space of white included between the yellow of the breast and sides; under wing-coverts white; axillaries yellow (♂, Rurukan, Minahassa, 6. VIII. 84: Platen in Mus. Nehrkorn, Nr. 974).

Iris brown; bill and feet black (Platen; Guillem. *a 12*).

Female. Like the male in coloration, but apparently a little smaller.

Measurements.	Wing	Tail	Tarsus	Bill from nostril
a. (Mus. Nehrk. 974) ♂ ad., Rurukan, 6. VIII. 84 . .	50	27	13	8
b. (C 12208) ad. Banka Id., N. Celebes, 12. V. 93 . . .	51	25	12.5	8

Five males in the Sarasin Collection and one in the Dresden Museum have the wing 48—51 mm; two females in the former collection: wing 48.

Distribution. Celebes — Minahassa (Wallace *a I*, *a 11*; Meyer *a 9*, etc.); Gorontalo Distr. (Meyer *a 9*); Lembeh Id. and Banka Id. (Nat. Coll.); S. E. Peninsula — Kandari (Beccari *a 8*); W. Celebes (Doherty *5*); S. Celebes (P. & F. Sarasin *3*, Everett *4*, Doherty *5*).

This little Flower-pecker was discovered by Wallace in the mountains of the Minahassa, where it haunts low bushes and shrubs and feeds on fruit *(a I)*. Meyer, Guillemard, and Platen, like Wallace, met with it at an elevation of upwards of 2000 feet in the same neighbourhood; but the first-named also found it at Limbotto, which is low land, and the Sarasins and Everett found it at Macassar as well as on the hills of the south. It is most nearly related to *P. sangirensis* of Great Sangi, from which it may be distinguished by its yellow sides and flanks, not grey tinged with yellow, and by the brighter, yellower tint of its olive-green upper surface. The only other known species which seems at all nearly related to them is Mr. Büttikofer's *A. annae* of Flores *(1)*. *A. vincens* (Sclat.) of Ceylon is dull steel-blue above, where the forms of the Celebesian area are olive-green, and it has the three lateral tail-feathers tipped with white. *A. quadricolor* of Panaon, Philippines, is black above with a red back and olive-yellow rump.

The genus *Acmonorhynchus* was set up by Mr. Oates (Faun. Brit. Ind. II 1890, 381), for *A. vincens* of Ceylon, in consequence of its having 9 primaries, instead of 10 as in *Prionochilus* and *Pachyglossa*. Mr. Büttikofer shows *(1)* that *A. quadricolor*, *A. aureolimbatus*, *A. sangirensis* and *A. annae* belong to the same genus. It is most nearly allied to *Piprisoma*, which also has 9 primaries and which Mr. Oates only distinguishes by its bill which "viewed from above is nearly an equilateral triangle with the two sides sinuated", for the square tail and nostrils free from hairs are points not sufficient to separate it from the Celebesian species. Mr. Büttikofer is of opinion that *Piprisoma modestum* of Burmah and Tenasserim may really belong to *Acmonorhynchus*, but, if this be true, *Acmonorhynchus* as a genus would be broken down, and *Acmonorhynchus aureolimbatus* (a large name for so small a bird!) would have to be called *Piprisoma aureolimbatum*.

There are one or two facts known in connection with *Acmonorhynchus* and the allied genera, *Piprisoma*, *Pachyglossa* and *Prionochilus*, which seem to be instructive. Mr. Oates shows (l. c. 375) that in *Prionochilus* there is a small first primary about equal in length to the tarsus; in *Pachyglossa* it is reduced, being not longer than the hind toe; in *Piprisoma* and *Acmonorhynchus* it is gone. As the normal number of primaries is ten, it follows that *Piprisoma* and *Acmonorhynchus* have lost a quill and represent, therefore, in respect of the wing a recent modification of structure. Further, though we are unable to speak of *Piprisoma*, *Acmonorhynchus* seems to display recent modifications of colour. *Acmonorhynchus vincens* of Ceylon is so like *Pachyglossa*, of which only one species

in the Himalayas is known, that it is impossible to doubt that they are very closely related (see figures of both in Ibis 1874, pl. I): the Ceylonese bird has changed in wing-structure, but very little in coloration, showing how a generic difference may be evolved, while specific characters remain constant[1]). *Acmonorhynchus quadricolor* of the Philippines has the back red, but the subterminal or basal part of the feathers black, "producing a mottled appearance" (Sharpe), and, if Mr. Keeler's hypothesis — that the tip shows the more recent and the basal part the former colour of a feather — be correct(?), then *A. quadricolor* once had a black back, which would make it somewhat like *A. vincens* and *Pachyglossa*. It would be of interest to know if the immature Philippine bird has a black back. The forms of the Celebes area and Flores with their olive-green upper surface (without black bases) are much more distinct. An investigation of the pigments in them and in *Pachyglossa* might be made with advantage.

From the foregoing it appears that *Pachyglossa* has some claim to be regarded as the ancestor of *Acmonorhynchus*. In the East Indies it has undergone much change, whether by reason of different food, climate, closer interbreeding, different animal foes, or whatever else may be supposed to have caused it to develop in fresh directions. This unknown quantity has not been encountered by the bird in the Himalayas, or it must have changed there also. Mr. Wallace has already *(c 2)* spoken of *A. aureolimbatus* as a Himalayan type in Celebes, and though it cannot now be regarded as one "unknown in any Malay island", since Mr. Büttikofer shows that the forms of Sangi, Flores, one of the Philippines, and Ceylon are of one genus, there is certainly some reason to think that it and the others originally came from the Himalayas.

Acmonorhynchus, with the closely allied genera *Piprisoma*, *Pachyglossa* and *Prionochilus*, does not occur in the Australian Region, being unknown east of Timor and the Molucca Strait. The relationship of *A. aureolimbatus* with *Dicaeum* may be seen in the finely serrated cutting edges of the terminal third of its bill, a character which, as Oates shows, connects the true *Dicaeidae* (a family in which some other genera are wrongly included by Dr. Sharpe) with the *Nectariniidae*.

* 178. ACMONORHYNCHUS SANGIRENSIS (Salvad.).

Sangi Yellow-sided Flower-pecker.

Plate XXVII.

a. **Prionochilus sanghirensis** *(1)* Salvad., Ann. Mus. Civ. Gen. IX, 1876, 59; *(2)* Meyer, Isis, Dresden 1884, 6; *(3)* Sharpe, Cat. B. X, 1885, 71; *(4)* W. Blas., Ornis 1888, 591.

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[1]) See, also, our speculations on the origin of the *Pernes* and *Spizaeti* under *Pernis celebensis*, and of certain Kingfishers under *Ceycopsis*.

Acmonorhynchus sanghirensis *(1)* Büttik., Zool. Erg. Weber's Reise in Ost-Ind. 1893, III, 303.

Descriptions. Salvadori *a 1*; Sharpe *a 3*; Blasius *a 4*.

Adult. Whereas in *P. aureolimbatus* the yellow of the breast is broken through in the middle and runs in even intensity along the sides of the body to the under tail-coverts, in *A. sangirensis*, as a rule, the breast, or upper abdomen as the case may be, is crossed by a band about 7 mm wide and rarely interrupted narrowly in the middle, while the sides of the rest of the body and to a certain extent the middle parts are coloured pale yellow-greenish and the under tail-coverts pale yellow (W. Blasius *a 4*).

Immature. Like *A. aureolimbatus*, but the general colour above darker yellowish olive-green, the sides of the breast bright ochre-yellow; abdomen, flanks and sides greyish white, the yellow of the breast slightly carried on to the last; under tail-coverts pale ochre (imm. ? Great Sangi: Meyer, C 1409). Prof. W. Blasius *(a 4)* regards a male with the orange-yellow of the breast less extended and less intense as an immature individual.

Iris yellow-brown (or red-brown); bill and feet black (Platen *a 4*).

Sexes. Sexual differences are very small, if any; at the most the orange-yellow breast-band in the male is somewhat broader and more brilliantly tinted and the male somewhat larger than the female (W. Blasius *a 4*).

Measurements. Wing 50—54.5 mm; tail 24—28.5; culmen 9—10.5; tarsus 13—13.5.

Distribution. Great Sangi (Bruijn *a 1*, Meyer in Dresd. Mus., Platen *a 4*).

Two specimens collected by Bruijn's hunters at the village of Petta and one by Meyer's hunters at Tabukan were apparently the only known specimens of this species until a series of thirteen, 7 males and 6 females, obtained by Dr. Platen were submitted to Prof. W. Blasius' careful examination.

As with *Dicaeum sangirensis*, the *Dicaeidae* furnish another link between Sangi and Celebes in the present species.

FAMILY NECTARINIIDAE.

The Sun-birds find their nearest affinities in the *Meliphagidae* and the *Dicaeidae*. From the latter they may be distinguished by their slender, decurved bills, usually longer than the cranium, and the wing always contains 10 primaries. The best means of distinguishing them from the *Meliphagidae* is afforded by the tongue; in the *Nectariniidae* it is tubular and protractile, with a bifid tip, in the *Meliphagidae* it is also protractile and bifid, but "each half is broken up into numerous stiff horny fibres, so as to form a brush" (Gadow); also the males of nearly all the *Nectariniidae*, except *Arachnothera*, have in places brilliant metallic colours, while the *Meliphagidae* are generally plainly coloured and unmetallic, though fine red occurs in the subfamily *Myzomelinae*.

The edges of both mandibles of the slender bill of the Sun-birds are finely serrated for their terminal third or more[1]), for the examination of which a lens is useful; the nostril is covered by a large coriaceous operculum, sometimes

[1]) The serrations are also seen at least in some of the *Meliphagidae*, for instance, *Myzomela* and *Melilestes*.

feathered, no nasal or rictal bristles; wing moderate, first primary generally small; tail never forked, either square, rounded, graduated, or with the two middle feathers much lengthened; tarsus and toes moderate.

Capt. Shelley (1876—1880) recognises 3 subfamilies: *Neodrepaninae*, with "the first primary longer than the seventh and cut away on the inner web towards the tip; sides of the head in adult males wattled" — consisting of a single species occurring in Madagascar; *Nectariniinae* and *Arachnotherinae* with the first primary the shortest, and no wattles. Mr. Oates diagnoses these latter subfamilies as follows: — *Nectariniinae*: "sexes different; plumage of male in part metallic; bill slender; nest pensile"; *Arachnotherinae*: "sexes alike; plumage non-metallic; bill large; nest cup-shaped, attached by a portion of the rim to a broad leaf". The affinities of *Promerops*, included by Shelley in the family, are doubtful (Newton).

The Sun-birds inhabit the Ethiopian, Oriental, and Australian Regions.

The males of many of the genera differ in coloration wonderfully from one another and from their females, yet the general similarity of the females of these genera to one another and the correspondence of the young male with the female shows that the males only have departed greatly from an original type. Celebes and the satellite island-groups are peopled with 5 genera — *Aethopyga* (Oriental — not in Australasia), *Eudrepanis* (Philippines and Great Sangi only), *Cyrtostomus* (generally distributed among the East India Islands), *Hermotimia* (not found west of Celebes, the Sangi and Talaut Islands), *Anthreptes* (Oriental, not known east of the Sula Islands and Timor). The Oriental affinities of Celebes are therefore stronger in this family than the Australian, 3 genera being found in the Great Sunda Islands and S. E. Asia, and only one, *Hermotimia*, being Moluccan and Papuasian; and even in this last genus the Celebesian species are so closely allied to *Nectarophila hasselti* of Burmah to Borneo that a line is drawn here only for the sake of convenience not because a sufficient natural gap is found.

GENUS AETHOPYGA Cab.

Distinguishable by the strongly graduated tail of the male (the two middle feathers sometimes much lengthened), and by its yellow rump.

Found from the Himalayas to the Philippines, Celebes, and Java.

* 179. AETHOPYGA FLAVOSTRIATA (Wall.).

Celebes Scarlet-breasted Sun-bird.

a. **Cinnyris** sp. *(1)* Wall., Ibis 1860, 140.

b. **Nectarinia flavostriata** *(1)* Wall., P. Z. S. 1865, 478, pl. XXIX, fig. 2; *(2)* Brügg., Abh. Ver. Bremen V, 1876, 73; *(3)* Rosenb., Malay. Archip. 1878, 272.

c. **Aethopyga** sp. *(1)* Salvad., Ibis 1865, 549.

d. **Promerops flavostriata** *(1)* Gray, HL. 1869, I, 110, Nr. 1349 (nec syn.).

Aethopyga flavostriata *(1)* Wald., Ibis 1870, 35; *(2)* Salvad., Ibis 1871, 248; *(3)* Wald., Tr. Z. S. VIII, 1872, 71; *(4)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 659; *(V)* Shelley, Monogr. Nect. p. 53, pl. (1877); *(6)* Salvad., Atti Ac. Sc. Tor. 1877, XII, 314; *(7)* Meyer, Ibis 1879, 132; *(8)* W. Blas., J. f. O. 1883, 119, 138; *(9)* Gadow, Cat. B. IX, 1884, 23; *(10)* Guillem., P. Z. S. 1885, 554; *(11)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 10; *(12)* Hart., Nov. Zool. 1896, 152; *(13)* id., ib. 1897, 161.

e. **Nectarinia** sp.? *(1)* Wald., Tr. Z. S. 1872, VIII, 71.

f. **Aethopyga beccarii** *(1)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 659, pl. XVIII, fig. 1, 2; *(2)* id., Atti Ac. Sc. Tor. 1877, XII, 315, 316 (note).

"Tampanisi randang", near Tondano, Nat. Coll.

"Tjui merah", Manado, Guillem. *10*, Nat. Coll.

"Kios-raä", Tulabello, Rosenb. *b 3*.

Figures and descriptions. Shelley *V*; Wallace *b I*; Salvadori *f I*; Brüggemann *b 2*; Gadow *9*.

Adult male. Sinciput and a long submalar stripe metallic violet-blue-black; rest of head, ear-coverts, neck, back, scapulars, and smaller wing-coverts dark scarlet, with dusky black bases to the feathers; wings dusky, the greater coverts and quills margined with dark scarlet like the back; rump light yellow; tail black, the upper coverts and a broad fringe to the rectrices metallic violet-blue; malar streak, chin, throat, and breast scarlet, the last with whitish and yellowish bases to the feathers, the chin and throat striated with straw yellow; remaining under parts dusky greenish olive; under wing-coverts white; edge of wing varied with brown; quills below shining dusky, inner edges whitish (near Tondano, [♂] ad., VIII.—IX. 92, Nat. Coll.: C 10819; Rurukan, ♂ ad., 8. VIII. 84, Platen in Mus. Nehrkorn, Nr. 958).

Iris brown; bill brown, below lighter; feet brown (Platen).

Female. Above olivaceous green, below more ochraceous; the black centres of the feathers of the head giving a squamose appearance; mantle, scapulars, upper tail-coverts, tail, edges of remiges and of wing-coverts chiefly red, the tips of the feathers (except of the remiges) more ochraceous or olivaceous; under wing-coverts light yellow (♀, between Ussu and Lake Matanna, S. E. Central Celebes: Sarasin Coll.).

Young male. Resembles the female, but Capt. Shelley believes the latter is never quite so red. Few females in which the sex has been anatomically ascertained are known.

Measurements (7 in adult male dress). Wing 54—57 mm; tail 40—47; bill from nostril 14—15.5; tarsus 14 c. An adult ♂ from Lake Towuti has the wing 52 mm (Sarasin Coll.).

Eggs. "The egg in my collection from the south of Celebes has a grey-white ground-colour, with pale grey shell-spots and black-brown superjacent spots, some of which are round, others straight vermiform and are equally distributed over the whole egg. The measurements are: 15 × 10.5 mm" (Nehrkorn MS.).

Two eggs in the Sarasin Coll. (mother-bird accompanying them), unfortunately much damaged, answer to Mr. Nehrkorn's description.

Nest. The nest sent with the above two eggs is a pendant, pear-shaped structure, attached to a small thorn-bearing twig, the entrance-hole in the side. It is composed chiefly of moss and bits of dead leaf (? bamboo), with dark root-fibres round the entrance, lined with finer pale fibres and plant-down (Tomohon, N. Celebes, 8. April, 1894: Sarasin Coll.).

Distribution. Celebes — Minahassa (Wallace *a 1*, *b I*, *9*, Meyer 7, etc.); Gorontalo Distr.

— Tulabello (Rosenb. *b 3*); West Celebes (Doherty *13*); S. E. Central Celebes (P. & F. Sarasin); S. E. Peninsula — Kandari (Beccari *4, f I*); South Peninsula — Indrulaman (Everett *12*).

This Sun-bird was discovered by Mr. Wallace in the forest district near Lake Tondano at an altitude of about 1500 feet. Meyer got it near the same place twelve years later, and five specimens, also killed in the same neigbourhood, were recently sent to the Dresden Museum by our native hunters, while Platen obtained it at a greater altitude at Rurukan, and the Sarasins got it there, as well as on Mt. Masarang at 1250 metres. They also found it near the great lakes of South-east Central Celebes, Towuti and Matanna. Everett sent one from the foot-hills of Mt. Bonthain. It seems to belong to the hill-forests, and we question if the locality "Manado" of the specimens in the British Museum is correct.

Aethopyga flavostriata is one of a group — the typical *Aethopyga*-group — with red backs, red breasts, and a yellow band across the rump, consisting of the following geographical species:

Name of species	Central India	Himalayas	Upper Burmah	Pegu	Tenasserim	Nicobars	Malay Penins.	Sumatra	Billiton	Borneo	Java	Negros, Cebu	Celebes
1. *Ae. vigorsi* (Sykes)	*												
2. *Ae. seheriae* (Tick.)	.	*											
3. *Ae. andersoni* Oates	.	.	*										
4. *Ae. cara* Hume	.	.	.	*	*								
5. *Ae. nicobarica* Hume	.	.	.	.	.	*							
6. *Ae. siparaja* (Rfl.)	.	.	.	.	.	.	*	*	*	*	*		
7. *Ae. temmincki* (S. M.)	.	.	.	.	.	.	.	*	.	*			
8. *Ae. mystacalis* (T.)	.	.	.	.	.	.	.	.	.	.	*		
9. *Ae. magnifica* Sh.	.	.	.	.	.	.	.	.	.	.	.	*	
10. *Ae. flavostriata* (Wall.)	.	.	.	.	.	.	.	.	.	.	.	.	*

The Celebesian *Ae. flavostriata* occupies, as Shelley shows, an intermediate position between *Ae. magnifica* and *Ae. siparaja*, being distinguishable from both by its yellow-striped throat and further from *Ae. magnifica* by its dusky olive, not black, abdomen and under tail-coverts, and by the same characters from *Ae. siparaja* in which they are "ashy brown, often tinted with olive" (Shelley *V*). The yellow-streaked throat occurs again in *Ae. mystacalis* of Java and *Ae. vigorsi* of India which are easily distinguished from it by their lengthened middle tail-feathers and other characters.

This section of the genus *Aethopyga* lends further support to Mr. Wallace's view of the recent separation of Borneo from Sumatra and Asia as shown by two species (one occurring indeed in Java and elsewhere), which display no appre-

ciable differences, and brings conviction that no variation has taken place since the land connecting Borneo and Sumatra was submerged by the China Sea.

The genus *Aethopyga* is not found east of the Molucca Strait. The long loose, downy feathers on the side of the rump, capable of being drawn over it so as to conceal the yellow, seem to afford the best mark of generic distinction for it. Sangi has furnished no member of this group.

GENUS EUDREPANIS Sharpe.

The male has the rump yellow, as in *Aethopyga*, but the tail is simply rounded and relatively shorter, rather more than half the length of the wing; under parts yellow, with or without other light tints. Range: Philippine and Sangi Islands.

* 180. EUDREPANIS DUIVENBODEI (Schl.).

Sangi Green-capped Sun-bird.

a. **Nectarinia duyvenbodei**[1]) *(1)* Schl., Ned. Tschr. Dierk. IV, 1873, 14; *(2)* Meyer, Sitzb. Ak. Wien 1874, LXX, 125 (excl. descr. fem.).

b. **Aethopyga? duyvenbodei** *(1)* Salvad., Ann. Mus. Civ. Gen. 1876, IX, 57.

c. **Aethopyga duyvenbodei** *(1)* Salvad., Atti Ac. Sc. Torino 1877, XII, 316; *(2)* Gadow, Cat. B. IX, 1884, 30; *(3)* W. Blas., Ornis 1888, 588; *(4)* Tristr., Cat. Coll. B. 1889, 213; *(5)* Everett, J. Str. Br. R. A. S. 1889, 135.

Eudrepanis duyvenbodei *(1)* Shelley, Monogr. Nect. 81, pl. 27 (1877); *(2)* Meyer, Isis, Dresden 1884, 6, 37.

Figures and descriptions. Shelley *1*; Schlegel *a 1*; Salvadori *b 1*; Gadow *c 2*; Blasius *c 3*.

Adult male. Forehead and crown metallic coppery green; sides of occiput, ear-coverts and neck dull crimson, mantle, back and scapulars yellow olive-green; wings dusky blackish, the smaller coverts metallic greenish blue, the larger series broadly fringed with this colour, the quills, except the outermost, edged with olive-green; rump gamboge-yellow; upper tail-coverts metallic violet-blue, tail-feathers dusky black, the three outer pairs tipped with brownish white about 10 mm broad in the outermost; lores and orbit yellow, the lores with dark tips; malar region, chin, throat and entire under-parts gamboge-yellow washed with orange on sides of breast; under wing-coverts white, yellower near edge of wing, axillaries light yellow (Tabukan, Great Sangi, [♂]: Meyer — C 5976).

Iris brown; bill and feet black. (Platen *3*).

Female. With no metallic parts in the plumage: above yellow olive-green, like the back of the male, head above scaly-looking, owing to subterminal black cross-marks; rump greenish yellow; wing- and tail-coverts like the back; entire under-parts yellow, less bright than in the male, the throat and chest slightly washed with olive (Tabukan, [♀], Meyer — C 2471). Base of under bill brownish yellow.

Young male in changing plumage. Like the female, but the head and neck browner, the crown, shoulders and upper tail-coverts varied with the metallic feathers of the adult

[1]) The correct way of spelling van Duivenbode's name is with an i.

male; only a few yellow feathers on the rump; under parts paler yellow mixed with orange (Tabukan, [♂ imm.], Meyer — Nr. 8475).

Young. Above like the female, but browner and duller; rump and upper tail-coverts yellowish olive; below pale yellow, with some obscure dusky tips on chin, throat and sides of breast, almost forming faint bars on the throat (Tabukan, juv. Nr. 8476).

Measurements. (13 males) wing 54.5—58.5 mm; tail 32—38; culmen from feathers of forehead 17—18; tarsus 17—18; (2 females) wing 51.5—52; tail 29; culmen 16—16.2; tarsus 16 (W. Blasius *3*).

A fully adult female in the Dresden Museum (that described above) measures: wing 56.5; tail 34; tarsus 17; bill fr. feath. foreh. 18. It appears, therefore, that Count Salvadori and Prof. Blasius are in error in describing the female as smaller than the male, and from the descriptions of these ornithologists, also, we infer that the specimens before them were immature. Three immature specimens before us are distinguishable from the old female by their smaller bills, besides by the browner tint of their heads, necks, and mantles, and in two cases by the paler yellow of their under-parts.

Distribution. Great Sangi (v. Duivenbode *a 1*, Hoedt *a 1*, Meyer *a 2*, Bruijn *b 1*, Platen *c 3*).

This species appears to be intermediate between *Aethopyga shelleyi* Sharpe of Palawan and Balabac and *Eudrepanis pulcherrima* Sharpe of Basilan near Mindanao and Samar and *E. jefferyi* Grant of North Luzon (Ibis 1895, 111, pl. V). The adult male of the first-named differs by its long, graduated tail, red mantle (as well as sides of head and neck), long moustachial stripe of red and metallic blue, and its non-metallic wing-coverts; the latter differs by its steel-blue ear-coverts and sinciput (not entire crown of head), the olive-green of the rest of the head and neck, the red jugulum, and short tail. Capt. Shelley places the Sangi bird in Sharpe's genus *Eudrepanis*, of which *E. pulcherrima* is the type. Count Salvadori shows that the broad yellow band across the rump leaves no doubt as to the affinity of the Sangi species with *Aethopyga*; but adds that on the other hand its tail being only a little graduated, and the middle rectrices not much lengthened, the metallic coppery of the wings, and the throat yellow like the under-parts remove it from the typical species of *Aethopyga* and make it a form intermediate between the genus *Aethopyga* and the genera *Anthothreptes* and *Chalcoparia*.

GENUS CYRTOSTOMUS Cab.

In this group the metallic colours of the male are restricted to the chin, throat, and sometimes the pileum; the upper surface is olive, — browner, greener, or yellower according to the species, the under parts chiefly yellow, when not black. The culmen is about half as long again as the cranium, and more decurved than in *Hermotimia* and *Eudrepanis*, the nasal operculum bare, the tail moderate, slightly rounded.

Cyrtostomus is found from North Australia as far as Burmah and Hainan.

181. CYRTOSTOMUS FRENATUS (S. Müll.).

Australasian Yellow-breasted Sun-bird.

Plate XXVI.

This species varies geographically, and ornithologists, who wish to avoid the burden of a multiplicity of trinomials, may find the employment of some such formulae as the following useful for indicating the presence of racial differences.

1. The typical Cyrtostomus frenatus.

a. **Nectarinia frenata** *(1)* S. Müll. Verh. Natuurk. Comm. 1839—44, 173 (New Guinea only); *(II)* M. & S. op. cit. Zool. Aves 1846, 61, t. 8, f. 1 ♂ ad. (New Guinea); *(3)* Wall. P. Z. S. 1862, 335, 342 (except Celebes); *(4)* Finsch, Neu Guinea 1865, 163 (exc. Cel.).

b. **Cyrtostomus frenatus** *(1)* Salvadori Orn. Pap. II 1881, 265 (exc. Celebes); *(2)* id., Agg. Orn. Pap. 1890, 111.

c. **Cinnyris frenatus** *(I)* Shelley, Monogr. Nect. 153, pl. 49 (1877 — exc. Celebes).

d. **Cinnyris jugularis** *(1)* Gadow, Cat. B. 1884 IX, 85 (southern race).

For synonymy cf. Salvadori *b 1.*

Figures and descriptions. Shelley *c I*; Müller & Schl. *a II*, Salvad. *b 1.*

Diagnosis. Bill longer; size larger; upper surface yellower olive-green. "Wing 58; tail 44; bill 19—21; tarsus 15" (Salvad.).

Distribution. From the Sula Islands to New Guinea, the New Britain Group and North Australia. (For exact localities see Salvadori *b 1.*)

2. Cyrtostomus frenatus saleyerensis Hart.

e. **Cinnyris frenata dissentiens** *(1)* Hart., Nov. Zool. 1896, 152 partim, 167.

f. **Cinnyris frenata saleyerensis** *(1)* Hart., Nov. Zool. 1897, 156.

Diagnosis. Size smaller; upper surface greyish olive; under parts much paler yellow.

Distribution. Saleyer Island (Everett *1*).

Remark. This form represents the greatest known extreme of differentiation in one direction, as the *typical C. frenatus* does in another. Three intermediate races have as yet been discriminated by Prof. W. Blasius and Mr. Hartert.

The first of these may be represented as:

Cyrtostomus frenatus > saleyerensis.

g. **Nectarinia frenata** *(1)* S. Müll. Verh. Natuurk. Comm. 1839—44, 173 (Manado tantum); *(2)* Müll. & Schl. op. cit. Zool. Aves 1846, 61 (Manado tantum); *(3)* Wall., P. Z. S. 1862, 335, 342 (Celebes); *(4)* Finsch, Neu Guinea 1865, 163 (Cel.); *(5)* Brügg., Abh. Ver. Bremen 1876, V, 73 (Celebes).

h. **Cyrtostomus frenatus** (Cab. & Heine) *(1)* Rchb., Hb. spec. Orn. Scansoriae 1853, 309 (Manado); *(2)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 658; *(3)* id. Orn. Pap. II, 1881, 265 (Celebes tantum); *(4)* W. Blas., J. f. O. 1883, 137; *(5)* Meyer, Isis, Dresden 1884, 37.

i. **Cinnyris frenata** *(1)* Guillem., P. Z. S. 1885, 554.

j. **Arachnechthra frenata** *(1)* Wald., Ibis 1870, 26 (Celebes); *(2)* id., Tr. Z. S. 1872, VIII, 71 (Celebes); *(3)* Meyer, Ibis 1879, 131, pt., 146.

k. **Cinnyris frenatus** *(1)* Shelley, Monogr. Nect. 153 (Celebes) (1877).
l. **Cinnyris jugularis** pt. *(1)* Gadow, Cat. B. 1884, IX, 84 (Cel.).
l^{bis}. **Cyrtostomus frenatus** var. **plateni** pt. *(1)* W. Blas., Ztschr. ges. Orn. 1885, 289 (N. Cel.).
m. **Cyrtostomus frenatus plateni** (nec W. Blas.), *(1)* M. & Wg., Abh. Mus. Dr. 1896, Nr. 2, p. 16.
n. **Cinnyris frenata plateni** (nec Blas.) Hart., Nov. Zool. 1896, 152.
o. **Cinnyris frenata meyeri** *(1)* Hart., Nov. Zool. 1897, 156, 161.

Diagnosis. Standing near the *typical C. frenatus*, but smaller, and browner (less yellow) olivaceous above.

Measurements (adults). Wing 49—56 mm; tail 31—39; bill from feathers of forehead 17—18; tarsus 12.5—14.

Distribution. North, West, East and South-east Celebes: Minahassa (Forsten *g 1*, Wall. *g 3*, *l 1*); Manado tua, Mantehage, and Banka Is. (Nat. Coll.); Gorontalo District (Guillemard *i 1*); Togian Id. (Meyer *j 3*); East Celebes (Nat. Coll.); South-east Celebes — Kandari (Beccari *h 2*).

The birds of the lowlands of South Celebes are represented by the formula:

Cyrtostomus frenatus < saleyerensis.

p. **Cyrtostomus frenatus** var. **plateni** *(1)* W. Blas. Ztschr. ges. Orn. 1885, 289, pl. XII, f. 1 (♂), f. 2 (♀) — ex parte (South Celebes).
q. **Cinnyris frenata** *(1)* Tristr., Cat. Coll. B. 1889, 214; *(2)* Büttik., Zool. Erg. Weber's Reise in Ost-Ind. 1893, III, 279 (Macassar).
r. **Cyrtostomus frenatus plateni** *(1)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 11.
s. **Cinnyris frenata plateni** *(1)* Hart., Nov. Zool. 1897, 156.

Figures. W. Blasius *p. I.*

Diagnosis. Like *C. frenatus saleyerensis*, but the olive of the upper parts with a slightly greener tinge, the under parts deep yellow, almost as in the *typical* form.

Distribution. Lowlands of South Celebes: Macassar (Wallace *l 1*, Platen *p I*, Weber *q 2*. P. & F. Sarasin), Batubassi (Meyer *j 3*), Kalibangkere (Platen *p I*).

We have next to do with the birds from the Peak of Bonthain and the highlands around it, which have been named by Mr. Hartert *C. frenata dissentiens*. Through the courtesy of Mr. Hartert and Prof. W. Blasius we have been able to compare four adult males of the supposed hill-form (including the type of *dissentiens*) with two adult males of the lowland bird (including the type of *plateni*), one specimen of each being already in the Sarasin Collection; these seem to be the only adult males known at present. The four hill-specimens proved to be a shade browner than the type of *plateni*, so confirming Hartert's opinion, but the Sarasins' specimen of the lowland form (Macassar) is intermediate, or even stands nearer to the birds from the hills. This is not sufficient, however, to disprove the existence of Hartert's supposed hill-race, on the other hand we believe that an average of many specimens from both spots will ultimately prove the existence of an almost inappreciable local differentiation, showing that the hill-birds stand a shade nearer to *C. frenatus saleyerensis* than to *C. frenatus < saleyerensis* of the plains of South Celebes. A formula is therefore required for the hill-birds, and it is an easy matter to propose such symbols, but not easy — indeed impossible to us at present — to suggest one which we could be sure would be the best.

Were it not for typographical difficulties, one method for the purpose would be to adjust the angle of the sign < to answer the needs of the case: thus the

formula *C. frenatus* = *saleyerensis* for a form which is equidistant from the *typical frenatus* and from *saleyerensis*, then *C. frenatus* < *saleyerensis* with a more acute angle for forms which incline towards *saleyerensis* in a less degree, and *C. frenatus* ⟨*saleyerensis* with a less acute angle for forms which incline towards *saleyerensis* in a greater degree. To indicate the estimated degrees mathematically (< 45°) is too fantastic a method to commend itself.

More practical — but to be condemned perhaps as suggesting an accuracy of knowledge which we do not possess — is the use of numerals as propounded elsewhere (see also *Haliastur indus*). Between the *typical C. frenatus* and the extreme *C. frenatus saleyerensis* we believe we could arrange a series of 24 "subspecies" with the small degree of difference seen between *C. f. plateni* and *C. f. dissentiens* taken for the unit: then the *typical* form remains the *typical C. frenatus*, or *C. frenatus*$_{24}$ *saleyerensis*$_0$; the Saleyer bird is *C. frenatus*$_0$ *saleyerensis*$_{24}$; the North Celebes bird *C. frenatus*$_{20}$ *saleyerensis*$_4$, standing much nearer to the *typical* than to the Saleyer form; the lowland bird of South Celebes *(plateni)* may be held to have, say, 7 times as much affinity with the Saleyer race as with the typical form, or: *C. frenatus*$_3$ *saleyerensis*$_{21}$; the Bonthain bird standing a little nearer still to that of Saleyer becomes: *C. frenatus*$_2$ *saleyerensis*$_{22}$.

These formulae are very easy to set up, but any one who will undertake to prove that the numerals are erroneously applied will have a difficult, and remarkable, piece of work to do.

It is preferable here to abstain from inventing a formula for the Bonthain birds. These specimens are referred to under:

Cyrtostomus frenatus dissentiens (Hart.).

t. **Cinnyris frenata dissentiens** *(1)* Hart., Nov. Zool. 1896, 152, pt.; *(2)* id., ib. 1897, 155.

Distribution. Bonthain Mts. — Indrulaman (Everett *1*); Loka (P. & F. Sarasin); "from the lower hills up to 6000 ft." (Doherty *2*).

Further local variation. Adults from Celebes may be at once distinguished from adults from New Guinea (Passim, Dore) by their browner olive-green upper surface. Not so an adult male from Buru (Nr. 1855), which is like Celebes birds as to its back, but is a trifle larger in size (wing 58 mm). An adult male from Batjan is a little browner above than the New Guinea specimens, though hardly distinguishable. Adult males from Peling and Banggai are larger in bill and body than the form of N. Celebes, but in colour they are often similar, that is, browner olive-green than the typical, eastern, *C. frenatus*. An adult male and female from New Britain are the yellowest specimens as regards their upper surface we have seen, and it appears as if an influence, which makes the birds become yellower or browner respectively, is felt in increasing force the further south and east or west the species ranges. In a similar manner *Haliastur indus* seems to have gradually lost its dark stripes in extending its range from India to the Papuan Islands. Mr. Büttikofer terms the characters pointed out by Prof. W. Blasius in *C. frenatus plateni* inconstant, so that even the separation of the Celebes-form as a subspecies appears unallowable; on the other hand, we find that individual variation in *C. frenatus* as a whole seems to run within comparatively narrow limits, though *plateni*, etc. are undoubtedly connected with the *typical* form of New Guinea by every conceivable intermediate form from the Moluccas.

The species, as a whole, may be described as follows:

Adult male. Upper surface and sides of head yellowish olive-green; superciliary and rictal stripe yellowish, quills dusky, edged with olive-green; tail black, the three outer feathers tipped with white, about 7—10 mm broad in the outermost; chin, throat and chest metallic purplish blue-black; remaining under parts dark yellow, axillaries brighter; under wing-coverts straw-yellow (Passim, New Guinea, ♂, June 1873: Meyer — C 275).

Female. Like the male, but chin, throat and chest yellow like the other under parts (Dore, ♀: Meyer — Nr. 8486, and others).

Young. Like the female, but washed with drab above, and paler yellow below (Manado tua, 8. IV. 93, Nat. Coll.: C 12220). Bill and feet black. Iris drab (♀, New Britain: Richards), brown (♂, Minahassa and S. Celebes: Platen *k 1* and in Mus. Nehrk.), red (Celebes: Meyer *h 3*), brown (N. Celebes, Guillem. *g 1*).

Measurements. Wing 49—58 mm, tail 31—44, bill 17—21, tarsus 12.5—15.

Eggs. "The *frenatus*-eggs in my collection form 3 types, which deviate greatly from one another. a. From Batjan are of a grey-yellow ground, with spots differing little from the ground-colour distributed equally over the entire egg. At the blunt end only a few black hair-lines are to be found. b. From Batjan are of a grey-brown ground, with similar washed out spots, very isolated black streaks are also to be seen. c. The eggs from Duke of York differ essentially from the others. They have indeed the same ground-colour, but the black and black-brown spots are sharply marked and form a circlet at the large end. Measurements: 16—17 × 11.5—12 mm" (Nehrk., MS.).

In Batjan the bird lays as many as 4 eggs. Two eggs from Aru (out of different nests Nr. 1529, 1531) apparently correspond with Nehrkorn's type b, and call to mind the eggs of the Sedge Warbler, *Acrocephalus phragmitis.*

In North Australia the egg is pear-shaped, generally and equally mottled with obscure dirty brown on a greenish grey ground (Gould, Hb. B. Austr. 1865, I, 585); two at a sitting, greenish grey ground-colour, almost obscured by freckles and dashes of light brown (North, Nests & Eggs B. Austr. 1889, 232).

Nest. Four nests of this species from Celebes in the Dresden Museum (Nrs. 125, 126, 127, 128) are of an oval inverted shape, length 130—140 mm (not counting some pendulous stuff in one case which would add 60 mm to the length), breadth 50—60 mm, entrance by a hole in the upper half. One nest is attached to a hanging twig passing down through it like a backbone, a second is suspended from a hanging plant-stalk, a third fastened to an upright thin plant-stalk bearing the dry seed-heads of a *Composita* or such like, which are worked into the body of the nest. Externally a great variety of materials disorderly arranged are found — masses of the dry excrementa of spiders or caterpillars entangled in the web, strips of bark, dead leaves, cotton, feathers, plant-fibres, grasses, a fragment of shirting; well lined with cotton, feathers — chiefly white ones — and in one case with many black, hair-like fibres of the sugar palm *(Arenga saccharifera).* Two nests from Aru differ from those of Celebes in being much longer (170—200 mm), and lighter in colour owing to the smaller amount of spiders' excrementa and the external structure chiefly being of grey strips of bark, leaf skeletons, cotton and grasses. No feathers — a strong feature in the Celebes ones — are to be found in the lining or walls of these nests. One is suspended among thin roots; the original support of the other is gone. In one a well formed hood over the opening is seen (Nr. 1529, 1531). One from Port Denison is of an oval form, with a small hood over the opening which is near the top; composed of fibrous

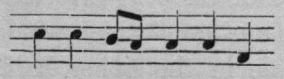
roots and shreds of cotton-tree *(Gomphocarpus)* bark, firmly interwoven with the webs and cocoons of spiders, and a few pieces of white sea-weed ornamenting the outside, lined with white feathers and silky native cotton; size about 5 × 3½ inches (Ramsay, Ibis 1865, 85). At Cape York: composed of *Melaleuca*-bark, a few leaves, various fibrous substances, rejectamenta of caterpillars, etc., and lined with the silky cotton of the *Bombax australis* (Macgill. in Gould l. c.). One of the nests obtained by Meyer in Celebes was taken in April.

Breeding season. Batjan — a nesting female was killed by Dr. Platen, 13. June, 1882 (Mus. Nehrk.). North Queensland and the islands of Torres Straits — November, December (Macgill., Ramsay, ll. cc.).

Distribution. Celebes to New Guinea, the Admiralty Is., New Britain group, the Solomons and North Queensland.

This Sun-bird is most nearly allied to *C. jugularis* (L.) of the Philippines, the adult male of which is distinguishable by its wanting the yellow stripes above and below the eye, by the metallic purple-black feathers of the throat encroaching on to the cheeks up to the lores, and by its browner upper surface. They belong to a group of which the males have the chin, throat, jugulum, and sometimes the forehead, metallic purple-blue-black, the remaining under parts yellow, sometimes with a band of another colour below the jugulum, the upper parts olivaceous, as follows:

1. *C. flammiaxillaris* (Blyth): Pegu, Tenasserim, Siam, Cochin China, Malay Peninsula.
2. *C. andamanicus* (Hume): Andamans.
3. *C. pectoralis* (Horsf.): Nicobars; Malacca; Sumatra; Borneo; Java; Lombok; Sumbawa (Guillem.); Flores; Samao (ten Kate).
4. *C. aurora* Tweedd.: Palawan.
5. *C. rhizophorae* (Swinh.): Hainan.
6. *C. jugularis* (L.): Philippines; Sooloo (Guillem., Everett).
7. *C. frenatus* (S. Müller): Celebes to the Solomons and Queensland.

In musical terms the note of *C. frenatus* is  .

* 182. CYRTOSTOMUS TEIJSMANNI (Bütt.).

Black-bellied Sun-bird.

Plate XXVI.

a. **Cinnyris teysmanni** *(1)* Büttik., Notes Leyden Mus. 1893, XV, 179; *(2)* Hart., Nov. Zool. 1896, 167, 182.

b. **?Cyrtostomus** sp. *(1)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 16.

Male. "Entire crown, sides of head, hind neck, mantle, back and rump, wing-coverts and outer edge of quills uniform earthy brown with a slight tinge of olive; upper tail-coverts purplish brown; tail-feathers purplish black, the outer webs narrowly edged with metallic green; chin and throat metallic purplish blue, flanked on both sides with a broad metallic green stripe, forming a moustachial streak which is produced down to the sides of the chest; the latter is separated from the breast

by a narrow maroon-brown cross-bar which is somewhat paler than in *C. asiaticus*; breast, flanks, abdomen and under tail-coverts black with a purplish gloss; pectoral tufts bright yellow without any trace of orange-red; under wing-coverts and thighs dusky black; bill of the same size as in *C. asiaticus* and *C. zenobia*, but rather less strongly bent, black; feet black. Wing 53 mm; tail 35; tarsus 15, bill from front 18" (Büttik. l. c.).

Female. "Greyish olive above, washed with green on the rump and the margins of the quills. A whitish yellow superciliary line over the eye. Beneath lemon-yellow, paler in younger birds, and always paler on the throat and under tail-coverts. Under wing-coverts and inner lining of wing whitish. Outer rectrices broadly tipped with white, these tips decreasing in extent towards the middle, so that the centre ones are only narrowly fringed with white on the tip. Wing about 2 or 3 mm shorter than in the male" (Hartert *a 2*).

Distribution. Djampea and Kalao (Everett *a 2*), ?Bonerate (Sarasins *b 1*), ?South Celebes (Teijsmann *a 1*).

Though the type of this species was indicated as having come from the Macassar District, it appears more probable that Teijsmann obtained it in Saleyer, though indeed the bird was not sent there by Mr. A. Everett. As Mr Büttikofer remarks:

"It agrees, as to the colour of the under-surface, very much with *C. asiaticus*, only the maroon-brown bar across the chest is somewhat paler, the abdomen and under tail-coverts are less strongly glossed with purple and the orange-red feathers in the pectoral tufts are wanting. But the bird cannot be an immature *C. asiaticus*, showing no marks of any metallic gloss on its upper-surface while the lower surface entirely presents the metallic plumage of the fully adult stage. In the transitional stages of *C. asiaticus* the upper-surface, which is much paler than in our Celebean bird, always shows strong marks of metallic blue, especially on rump and lesser wing-coverts, long before the lower-surface has assumed its full metallic plumage. This bird is rather to be placed in Capt. Shelley's *Cyrtostomus* or olive-backed Asiatic group, in which the green-backed *C. zenobia* from the Moluccas would be its nearest ally."

We should say that this bird forms an approach to the Celebesian members of the *Hermotimia*-group, as shown by its having a submalar stripe of a different tint from the throat, and yellow pectoral tufts, which sometimes make their appearance to a small extent in adult males of *H. sangirensis* in Siao.

GENUS HERMOTIMIA Rchb.

The black Sun-birds are best distinguished by their having the operculum of the nostril feathered, and by their general colour of black, with metallic hues of gold, purple, etc. on the head, chin, throat, rump, upper tail-coverts and tail, and more or less on the lower back and wing-coverts. The tail is moderate, shorter than the wing, rounded or graduated. The species are chiefly Papuasian, Moluccan and Celebesian, but *Chalcostetha* which ranges from the Sunda Islands to Tenasserim is hardly separable as a genus.

183. HERMOTIMIA AURICEPS (G. R. Gray).

Moluccan Black Sun-bird.

a. **Nectarinia auriceps** *(1)* Gray, P. Z. S. 1860, 348; *(2)* Wall., ib. 1862, 335, 343; *(3)* Brüggem., Abh. Ver. Bremen 1876, V, 465; *(4)* W. Blas., J. f. O. 1883, 158, 162.
Hermotimia auriceps *(1)* Salvad., Atti Ac. Sc. Tor. 1874, X, 228; *(2)* id., Orn. Pap. II, 1881, 260; *(3)* id., Ibis 1884, 325; *(4)* id., Agg. Orn. Pap. 1890, 110; *(5)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 2, p. 17.
b. **Cinnyris auriceps** *(1)* Shelley, Monogr. Nect. 99, pl. 34, fig. 1 (1877).
c. **Cinnyris aspasiae** pt. *(1)* Gadow, Cat. B. IX, 1884, 68.
"Tomonsi", Balante, E. Celebes; **"Tomonsi payung"**, Peling, Banggai; **"Suka"** (♀), Banggai, Nat. Coll.

For further synonymy and references see Salvadori *2, 4.*

Figures and descriptions. Shelley *b I*; Salvadori *1, 2*; Gadow *c 1.*

Adult male. Velvety black; head above greenish gold; lesser and middle wing-coverts, lower back, rump, upper tail-coverts and outer edges of tail-feathers steel-blue-black; chin, throat and jugulum similar steel-blue-black; the black of the remaining under parts slightly washed with blue (Balante, E. Cel. — C 14312). Iris dark brown *(b I)*.

Female. Head above and hind neck ashy brown; back and scapulars olive [greenish]; wings brown, the feathers with broad olive edges, which on the quills have a slightly more yellow shade; tail black with white ends to all but the centre feathers, the white tips broadest on the outer ones; chin and throat white; breast, abdomen and under tail-coverts pale yellow; under wing-coverts and inner margins of the quills white, the former slightly shaded with sulphur-yellow: bill and legs black; irides dark brown (Shelley *b I*).

Egg. "Of this bird I possess an egg collected by Dr. Platen in Halmahera, which very much resembles those of *C. frenatus*. It has a grey ground, violet under-spots and darker spots, between which black points are scattered. The measurements are: 16 × 11 mm" (Nehrkorn MS.).

Distribution. E. Celebes, Peling, and Banggai (Nat. Coll. *5*); Sula Islands (Allen *a 2, c 1*); Moluccas as far as Waigiou and Obi (Salvadori *2, 4* — who should be consulted for exact localities).

This bird is most closely related to *H. morotensis* (Shelley) of Morty, a form with a greener crown and with a greener tint to the steel-blue portions of the plumage. The racial differences seem so small that it appears highly probable that they may fall within the scope of the individual variation of adult males in *H. auriceps* and so be bridged over, with the result of one species and perhaps two subspecies. Two specimens of the present species have been recorded from Gorontalo by Brüggemann, and the record is repeated in Shelley's great work. Through the kindness of Prof. von Koch we have been able to examine the two specimens in the Darmstadt Museum: they are now labelled "Celebes, Minahassa" (not Gorontalo), without a collector's name, and on the back the dealer's name "Schneider, 17. III. 76". We agree with Prof. W. Blasius in holding them for *H. auriceps*, and he rightly adds: "The two Darmstadt examples are therefore dirived from the unreliable collection mentioned

(J. f. O. 1883, 132 — a collection obtained by Schneider from Duivenbode composed of specimens from Celebes, Ternate and Halmahera); and herewith their authority ceases" *(a 4)*.

A series of 11 were included among a number of birds from Balante, East Celebes, collected by native hunters, together with others from Peling and Banggai, for the Dresden and Tring Museums.

A specimen in the Dresden Museum wrongly referred to by us in J. f. O. 1894, 245 as *Hermotimia porphyrolaema*, is also not the same as *H. auriceps*, differing in having the mantle, as well as the lower back, etc. glossy steel-blue. It is labelled by van Musschenbroek: "Manado, VI. 74 ♂". This is a new species, which we abstain from naming till another specimen reaches us.

* 184. HERMOTIMIA PORPHYROLAEMA (Wall.).

Celebesian Black Sun-bird.

The typical form belongs to South Celebes. A subspecies from East Celebes has been named, but the northern birds, as regards the adult male at least, are sufficiently peculiar to justify their being treated as a species. The two known forms of *H. porphyrolaema* are:

1. The typical Hermotimia porphyrolaema.

a. **Nectarinia aspasia** pt. *(1)* S. Müll., Verh. Natuurk. Comm. 1846, 58, 64, 65 (Macassar).
b. **Nectarinia porphyrolaema** *(1)* Wall., P. Z. S. 1865, 479.
c. **Promerops porphyrolaema** *(1)* Gray, HL. 1869, I, 110, Nr. 1360.
d. **Chalcostetha porphyrolaema** *(1)* Wald., Ibis 1870, 46; *(2)* id., Tr. Z. S. 1872, VIII, 71; *(3)* Meyer, Sitzb. Ak. Wiss. Wien 1874, LXX, 123; *(4)* id., Ibis 1879, 131, 146.
e. **Hermotimia porphyrolaema** *(1)* Salvad., Atti Ac. Sc. Tor. 1874, X, 232; *(II)* id., Ann. Mus. Civ. Gen. 1875, VII, 660, pl. XVIII, f. 3; *(3)* id., Atti Ac. Sc. Tor. XII, 1877, 310; *(4)* id., Orn. Pap. II, 1881, 261; *(5)* id., Ibis 1884, 325; *(6)* W. Blas., Ztschr. ges. Orn. 1885, 287; *(7)* id., J. f. O. 1885, 403; *(8)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 11.
f. **Cinnyris porphyrolaemus** *(I)* Shelley, Monogr. Nect. 95, pl. 32, f. 1 (1877); *(2)* Büttik., Zool. Erg. Weber's Reise in Ost-Ind. 1893, III, 279; *(3)* Hart., Nov. Zool. 1896, 152; *(4)* id., ib. 1897, 157, 161.
g. **Nectarophila grayi** pt. *(1)* Meyer, Ibis 1879, 132, 146 (Togian).
h. **Cinnyris aspasiae** pt. *(1)* Gadow, Cat. B. IX, 1884, 68, 70, 72, 73.
"**Tjui tjui itam**" (Malay: itam = black), South Celebes, Platen *e 6*.
Figures and descriptions. Shelley *f I*; Salvadori *e II*, *e 1*; Wallace *b 1*; Gadow *h 1*; W. Blasius *e 6*.
Adult male. Velvety black; the least wing-coverts, metacarpal edge, lower half of back, upper tail-coverts and a broad edging to the tail-feathers metallic steel-blue-black; head above metallic greenish gold; chin and throat metallic violet, bordered at the sides by a submalar stripe of steel-blue (♂ ad. Tjamba Distr., S. Celebes, 22. VI. 78: Platen — C 13202). Iris brown; bill and feet black (Platen).
Young male. Head above and nape grey, with dark centres to the feathers; quills brown; mantle, back and external edges of quills olive-yellow [yellow-olive]; chin and

throat down to the breast white; remaining under-parts yellow; lesser under wing-coverts at the edge of the wing yellow, the others white. The malar stripe and the middle tail-feathers steel-blue as in the adult; also two new golden green feathers of maturity in the cap (after W. Blasius *e 6*).

Female. Much like the young male, without the last-mentioned characters. Upper half of head and back of neck ashy grey; back, scapulars and least wing-coverts olive [yellow-olive]; remainder of wings dark brown, with all the feathers broadly edged with olive, on the quills yellower; tail black, the feathers mostly tipped with white, most broadly so on the outer ones; chin and throat white; breast, abdomen and under tail-coverts sulphur-yellow; quills below brown, their inner margins and the under wing-coverts white, the latter partially washed with pale yellow (after Shelley *e I*).

Measurements (5 adult males). Wing 58.5—63 mm; tail 36—40.5; culmen 15.5—17.5; tarsus 14 (W. Blas. *e 6*).

Distribution. S. and W. Celebes: — Macassar (S. Müller *a 1*, Wallace *b 1*, *f 1*, Meyer *d 4*, Platen *e 6*, Weber *e 2*, etc.); Tjamba Distr. (Platen *e 6*); Luwu, at the head of the Gulf of Boni (Weber *e 2*); Moroneng, Gulf of Mandar, and Enrekang, S. W. Central Celebes (P. & F. Sarasin *e 8*); Dongala, W. Celebes (Doherty *f 4*).

2. Hermotimia porphyrolaema scapulata M. & Wg.

i. **Hermotimia porphyrolaema scapulata** *(1)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 2, p. 16.

Diagnosis. Differs from the *typical H. porphyrolaema* by having the greater part of the scapulars, and the shorter middle wing-coverts, as well as the least series, metallic steel-blue, uniform with the lower back. The black of the upper parts is more intense and glossy, that of the under surface strongly washed with violet or blue.

Distribution. East Celebes — Tonkean (Nat. Coll.); ? S. E. Celebes — Kandari (Beccari *e II*); ? Togian Id. (Meyer *f I*, *d 4*).

It was first remarked by Mr. Büttikofer that this Sun-bird is the southern representative of *H. grayi* of the north of the island. The latter species may be distinguished by the dark crimson, not black, of the mantle and breast, the bases of the feathers being dusky, but black immediately next the crimson, forming a bar. *H. porphyrolaema* is known to occur as far north as the Togian Islands, where the specimen figured by Capt. Shelley was obtained by Meyer in 1871; *H. grayi* has been recorded by Meyer from Togian in common with the southern form, but we have since found out that this is an error. Shelley remarks that the "Togian" *H. porphyrolaema* is a trifle larger (wing 63.5 mm) than two specimens from Macassar, but does not differ in coloration, its measurements, too, do not appreciably exceed those of Platen's largest specimens *(6)*. Probably the Togian birds will be found to stand very near those of E. Celebes when known.

H. porphyrolaema also has affinities with *H. auriceps* (Gray) of Sula and the Moluccas, which differs chiefly in having the metallic throat uniform steel-blue-black, not violet with a submalar stripe of steel-blue. A really closer relationship exists between *H. porphyrolaema* and *H. talautensis* M. & Wg. of the Talaut Islands, a form with a similar steel-blue submalar stripe, but with a much redder

purple tint on the throat which changes from pansy-purple to maroon-purple with a coppery lustre, according to the light; the metallic crown of this bird is of a trifle deeper greenish gold, and the size larger. *H. sangirensis* (Meyer) has departed a little more widely; it has the throat coppery-bronze and the submalar stripe purple-steel-blue. The Celebes Province thus possesses the only species of *Hermotimia* with a submalar stripe of a different colour from the throat, viz:

H. porphyrolaema: South, West and East Celebes;
H. grayi: North Celebes;
H. sangirensis: Sangi;
H. talautensis: Talaut.

* 185. HERMOTIMIA GRAYI (Wall.).

North Celebes Black Sun-bird.

a. **Nectarinia grayi** *(1)* Wall., P. Z. S. 1865, 479; *(2)* Brügg., Abh. Ver. Bremen 1876, V, 73.

b. **Promerops grayi** *(1)* Gray, HL. I, 1869, 110, Nr. 1359.

c. **Nectarophila grayi** *(I)* Wald., Ibis 1870, 20, 42, pl. 1, f. 2; *(2)* id., Tr. Z. S. 1872, VIII, 71; *(3)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 660; *(4)* Lenz, J. f. O. 1877, 375; *(5)* Meyer, Ibis 1879, 132 (nec Togian); *(6)* W. Blas., J. f. O. 1883, 138; *(7)* id., Ztschr. ges. Orn. 1886, 197.

Hermotimia grayi *(1)* Salvad., Atti Ac. Sc. Tor. 1877, XII, 310, 313; *(II)* Meyer, Vogelskel. I, 1894, t. CCVII; *(3)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 11.

d. **Cinnyris grayi** *(I)* Shelley, Monogr. Nect. 91, pl. 31 (1877); *(2)* Gadow, Cat. B. IX, 1884, 66; *(3)* Guillem., P. Z. S. 1885, 554; *(4)* Tristr., Cat. Coll. B. 1889, 214; *(5)* Hart. Kat. Vog. Slg. Senckenb. Mus. 1891, 30.

"Burong tjui kapala mas" (Golden-headed), Malay, Minahassa, Meyer *c 5.*

"Burong tjui itam" (itam = black), Malay, Nat. Coll.

Figures and descriptions. Shelley *d I*; Walden *c I*; Meyer *II* (skeleton); Brüggemann *a 2*; Gadow *d 2.*

Adult male. Just like *H. porphyrolaema* ♂ ad. of S. Celebes *(descr. antea)*, but the neck, mantle, scapulars and breast dark blood-red, not black, the bases of the feathers blackish, forming a black cross-mark anterior to the broad red fringe of the terminal part; some of the middle, as well as the lesser, wing-coverts metallic steel-blue, the others and the inner greater series touched with red (Lotta, 12. V. 93: Nat. Coll. — C 12211).

Iris red; feet, claws and bill black: Meyer *c 5.*

Adult female. Upper parts ashy brown, with the entire back, scapulars, and least and median wing-coverts shaded with olive; remainder of wings dark brown, the greater coverts and quills broadly edged with olive-yellow; upper tail-coverts and tail black, the latter with white tips to some of the outer feathers; chin and throat white; breast and under tail-coverts pale yellow; quills below brown, inner margins and the under wing-coverts white, the latter shaded with sulphur-yellow (after Shelley *d I*).

Young male. Much like the female; chin and throat washed with greenish yellow; malar stripe steel-blue, as in the adult male; some steel-blue feathers in the upper tail-

coverts; tail-feathers edged with steel-blue (Manado [♂], III. 71; Meyer — Nr. 8520).

Measurements.

	Wing	Tail	Tarsus	Bill from forehead
a. (C 12211) [♂] ad. Lotta, 12. V. 93	58	36	14.5	16
b. (C 12214) [♂] ad. Lotta, V. 93	58	35	13	15.5
c. (C 312) [♂] ad. Manado, III. 71	59	37	14.5	—
d. (Nr. 6335) [♂] ad. Celebes	—	38	—	15.5
e. (C 12213) [♂] ad. Banka Id. 11. V. 93	59	38	—	15
f. (C 12212) [♂] ad. Manado tua Id., 14. IV. 93	61	41	14	—
g. (Nr. 8520) [♂] juv. Manado, III. 71	56	37	14.5	16
h. (Nr. 8519) [♀?] juv. Manado	53	34	14	—

Skeleton.

Length of cranium	31.0 mm	Length of tarso-metatarsus	14.0 mm
Greatest breadth of cranium	10.7 »	Length of digitus I	9.0 »
Length of humerus	13.0 »	Length of digitus II	8.5 »
Length of ulna	16.2 »	Length of digitus III	10.9 »
Length of radius	14.3 »	Length of digitus IV	9.0 »
Length of manus	14.7 »	Length of sternum	15.0 »
Length of metacarpus	7.7 »	Greatest breadth of sternum	10.0 »
Length of digitus I	2.3 »	Height of crista sterni	5.5 »
Length of digitus II	6.2 »	Length of coracoideum	11.7 »
Length of digitus III	1.6 »	Length of scapula	14.0 »
Length of femur	11.3 »	Length of clavicula	11.5 »
Length of tibia	20.0 »	Length of pelvis	16.0 »
Length of fibula	7.0 »	Greatest breadth of pelvis	11.0 »

Distribution. North Celebes — Minahassa (Wallace *a 1*, Meyer *c 5*, etc.); Banka and Manado tua Is. (Nat. Coll. in Dresd. Mus.).

This Sun-bird appears to be a local species, having its affinities with *H. porphyrolaema* of South Celebes from which it differs by its red back and breast. In the countries to the west it is most nearly related to *Nectarophila hasselti* (T.) which ranges from Burmah to Sumatra, Borneo and Java, a species with a red breast, but black back and mantle. For convenience' sake we draw the line of generic separation as Salvadori and others have done between *Hermotimia grayi* and *Nectarophila hasselti*, though the points of distinction are very small indeed: *Hermotimia* has the bill straighter and the ridge of the culmen sharper, *Nectarophila* has the bill more decurved for the terminal half and the culmen more rounded. To speak of *Hermotimia* as a Papuan genus in Celebes would be likely to convey a wrong impression.

The *Cinnyridae* afford striking cases of sexual differences of coloration, though less remarkable than what is seen in the *Paradiseidae* and *Gallinae*. The bright colouring of the males causes them to be shot by collectors in much larger numbers than the females, and the latter are generally scantily represented in Museums. Whilst the males have become differentiated into a number of striking types of coloration, a curious sameness runs through the females. Of

Celebesian genera as yet considered, the male of *Cyrtostomus* has departed least from the female type; the males of *Hermotimia* and *Aethopyga* are vastly different from their females and must be regarded as highly specialized forms. The males of *Nectarophila* afford transitions from *Hermotimia* to *Cyrtostomus*, while extreme forms of *Cyrtostomus* also independently make a near approach to *Hermotimia* (cf. *C. teijsmanni*).

* 186. HERMOTIMIA SANGIRENSIS (A.B.M.).

Sangi Black Sun-bird.

a. **Chalcostetha sangirensis** *(1)* Meyer, Sitzb. Akad. Wiss. Wien 1874, LXX, 124.

b. **Nectarinia duyvenbodei** part. *(1)* Meyer (nec. Schl.) l. c. *a 1* (descr. ♀ = ♂ juv.).

Hermotimia sangirensis *(I)* Salvad., Atti Ac. Sc. Tor. 1874, X, 233, pl. I, f. 2; *(2)* id., op. cit. 1877, XII, 311, 313; *(3)* Meyer, Isis, Dresden 1884, 6, 37.

c. **Hermotimia sanghirensis** *(1)* Salvad., Ann. Mus. Civ. Gen. 1876, IX, 56; *(2)* W. Blas., Ornis 1888, 584.

d. **Cinnyris sangirensis** *(I)* Shelley, Monogr. Nect. 97, pl. 32, f. 2, and pl. 33 (1877); *(II)* Gould, B. New Guinea III, pl. 32 (1878).

e. **Cinnyris sanghirensis** *(1)* Gadow, Cat. B. IX, 1884, 74; *(2)* Tristr., Nat. Coll. B. 1889, 215.

"Taramisi maitung", Great Sangi, Nat. Coll.

"Taramisi pahopa", ♂ imm. Great Sangi, iid.

"Taramisi lana", Siao, iid.

Figures and descriptions. Shelley *d I*; Gould *d II*; Salvadori *I*, *c 1*; Meyer *a 1*; Gadow *e 1*.

Adult male. Like the adult male of *H. porphyrolaema*, but with the chin, throat and jugulum coppery-bronze with a submalar stripe of steel-blue, not violet with a similar steel-blue stripe; the mantle and under surface purplish black, not jet-black washed on the under-part with bluish (type, Siao: Meyer — Nr. 13684).

Remark. This specimen and another adult male from Siao have one or two yellow feathers on the sides of the breast above the axillaries, calling to mind the pectoral tufts of *Cyrtostomus zenobia* (Less.) of the Moluccas, *teijsmanni* (Bütt.) of South Celebes, *Arachnechthra lotenia* (Linn.) and *A. asiatica* (Lath.) of the Indian Region, and *Chalcostetha insignis* (Jard.) of the Great Sunda Islands to Tenasserim. In two other adult males from Siao and others from Great Sangi as also in 25 adult males discussed by Prof. W. Blasius *(c 2)* no trace of yellow pectoral tufts is to be seen. The occasional presence of pectoral yellow in Siao birds seems to show it to be an ancestral character in process of undergoing extinction.

Female. Above pale olive-green, mantle and forehead greyer; quills dusky edged with yellowish olive-green; upper tail-coverts blackish; tail black tipped with white, scarcely perceptible on the two central feathers, most broadly on the outermost; under surface greenish yellow; brightest on the throat, more washed with olive on the breast; flanks pale olive-grey; under wing-coverts and inner edges of quills below where they rest upon the body white; axillaries yellowish. (Tabukan, [♀] Meyer — C 8514.)

Young. Like the female, but browner and greyer above; under-parts paler; bill shorter and straighter. (Siao — Nr. 8516.)

Immature male. Like the adult female, submalar stripe steel-blue with an inner row of coppery

bronze feathers; feathers of male maturity in tail, inner quills and scapulars. (Siao, Nr. 8511.)

Two others are in a curious pied plumage: head, neck, throat and mantle generally like the adult female, but varied on the mantle with adult male feathers; the remaining parts generally as in the adult male, so that the head end or half of the bird is like the mother, the lower end or half like the father, the greenish yellow throat and jugulum contrasting remarkably with the black of the breast and remaining under-parts (Great Sangi, Meyer — Nr. 6322; Nat. Coll., 16. VII. 93 — C 12712).

Measurements (25 ad. ♂♂ — Blasius *c 2*). Extremes of wing 57—62 mm; tail 40.5—46; culmen 15—17. Tarsus 15 ca.

The female seems to be smaller than the adult male, as shown by three measured by Prof. W. Blasius. That described above has wing 55 mm; tail 33; culmen 16; tarsus 14.5 (Gt. Sangi).

Eggs. "Dr. Platen, when in Great Sangi, collected a number of eggs of this bird, which are deep coffee-brown and at the large end show a black-brown circlet, formed of dissolved spots. On some eggs traces of black cross-streaks are perceptible. The measurements are: 16 × 12 mm. The gloss is very strong." (Nehrkorn MS.)

Nest? A number of nests sent to the Dresden Museum by our native collectors from Great Sangi and Siao, bearing indifferently the native names of this species and of *Anthreptes chlorigaster* are of an inverted pear-shape, with the entrance in the upper half covered by a small hood, externally a rough mass of bits of leaf, bark, rotten wood, grasses, spiders' or caterpillars' excrementa, wool, the whole bound together with spiders' web, lined with finer grasses and sometimes a few feathers. The nest is suspended at the end of a twig of a broad-leaved plant or among fine parasitical twigs.

Breeding season. A brooding female was killed by Dr. Platen on January 28th, 1887 (Blas. *c 2*). Thus we know that the bird breeds in the rainy season.

Distribution. Sangi Islands — Siao (Meyer *a 1*, Nat. Coll. in Dresd. and Tring Mus.); Great Sangi (Meyer *a 1*, Bruijn *c 1*, Platen *c 2*, Nat. Coll.); Tagulandang and Gunong Api (Nat. Coll.).

This species most nearly resembles *H. talautensis* of the Talaut Islands to the north-east, a bird of rather larger size, with a throat of pansy-purple changing to maroon-purple with a coppery gloss according to the light, but under no conditions of light to coppery-bronze, as in *H. sangirensis*. Its back and under parts, also, are not brownish, or purplish, black. Shelley remarks that *H. sangirensis* is the member of the *Hermotimia* group which, in virtue of the bronzy copper colour of its throat, most nearly approaches *Chalcostetha insignis*, and the occasional presence of yellow pectoral tufts in Siao birds (see *supra*) leads very interesting confirmation to this view.

* 187. HERMOTIMIA TALAUTENSIS M. & Wg.

Talaut Black Sun-bird.

Plate XXVII.

Hermotimia talautensis *(1)* M. & Wg., J. f. O. 1894, 244; *(2)* iid., Abh. Mus. Dresd. 1895, Nr. 9, p. 5.

"Taramisi bamburuwanan" (= ♂ ad.), Nat. Coll.

"Taramisi baä", "T. maririka" and **"Tete mariri"**, etc. (= ♀ and ♂ juv.), Nat. Coll.

Description. M. & Wg. *1.*

Adult male. Velvety black; lesser and shorter middle wing-coverts, lower half of back and upper tail-coverts metallic steel-blue; tail-feathers blue-black, with broad metallic edgings of greenish steel; head above metallic greenish gold; submalar stripe steel-blue, becoming violet on the sides of the jugulum; chin, throat and jugulum metallic pansy-purple, becoming redder and more coppery according to the light; under-parts black, slightly washed with blue; quills below dusky. Bill and feet black (type, ad. [♂], Kabruang, 3. XI. 93: Nat. Coll. — C 13138).

Female. Above olive-green with a slight orange wash; wing-coverts and quills dusky, edged with olive-green; tail-feathers bluish black, metallic at the edges, the three outer pairs tipped with white, about 10 mm broad in the outermost; under-parts ochre-yellow, bright orange-ochraceous on the throat and jugulum, washed with olive-grey on the flanks; under wing-coverts and inner edges of quills white; carpal edge yellowish (type [♀] ad. Kabruang, 13. XI. 93: Nat. Coll. — C 13145).

Two other specimens, agreeing with the above, we regard as adult females from the richness of their coloration (C 13149 and 13147).

Judging from the good series of this species and *sangirensis* in the Dresden Museum, we find that the orange-colour on the throat is less strongly expressed in the female of *H. sangirensis*, from which that of *H. talautensis* is further distinguishable by its larger size and the olive-green, washed with orange, of its upper surface.

Young. A specimen with a rather shorter bill is similar to what we describe as the adult female; head and mantle a little greyer (Kabruang, C 13150).

Three other specimens (immature females?) have the bill as long as in the adult, the throat whitish yellow, the breast greener, the head above in two cases a shade browner than in the adult female (Kabruang, C 13148 and 13153, Salibabu, C 13156).

Immature male. Five specimens, like the adult female, the throat washed with orange in two, in the other three not. All specimens with a steel-blue submalar stripe like that of the old male, but not continued (as violet) down the sides of the jugulum also. The feathers of male maturity sprout at different times and parts of the body, varying in individuals and apparently following no rule of development. Thus, in one specimen (Kabruang, C 13146) there is a single steel-blue feather in the wing-coverts of the right wing and a few black feathers on the right side of the mantle and middle of upper breast; a second (Kabruang, C 13144) has some green-gold feathers on the occiput, one or two steel-blue ones on the upper tail-coverts, and one or more black ones on the breast, tail apparently adult; a third (Salibabu, C 13155) has only a few green-gold feathers on the occiput, and an adult tail.

Measurements (7 adult males). Wing 64—68 mm; tail 42—45; bill from nostril 14.5—16; tarsus 16 ca.

(3 adult ? females). Wing 60—64; tail 38 ca.; bill from nostril 14—15.5. The specimen described as young has the wing 58, bill fr. n. 13; the three specimens without orange on the throat: wing 58—59, bill fr. n. 14.5—16.

Distribution. Talaut Islands: Kabruang, Karkellang, and Salibabu (Nat. Coll. in Dresd. and Tring Museums).

Numerous examples of this species were obtained in October—November, 1893, in the above island of the Talaut-group by native hunters in our employ, and again in the 1894 and 1896. In coloration — though not in geographical location — the adult male is intermediate between *H. sangirensis* of the Sangi

Islands and *H. porphyrolaema* of S. Celebes and Togian, both of which it exceeds in size, while *H. sangirensis* differs in having the metallic throat coppery-bronze, not pansy-purple, with the mantle and under surface purplish or brownish black, not deep black slightly washed with bluish below. *H. porphyrolaema* has the metallic throat dark violet, as against the much redder — sometimes, according to the light, coppery—purple of *H. talautensis*, and the metallic feathers do not extend on to the jugulum in the South Celebes bird. In our original description of *H. talautensis* a specimen labelled *H. porphyrolaema*, but really belonging to a new and undescribed species, was erroneously brought into comparison with the Talaut bird under the name *porphyrolaema*. The metallic mantle of this specimen and its uniform steel-blue throat, without a submalar edging of a different tint, remove it to a different section of *Hermotimia*, but as is mentioned, p. 465, it appears preferable for the present to abstain from giving it a name.

Chalcostetha insignis (Jard.). The habitat of this species is Tenasserim and Malacca to Sumatra, Java, Billiton (Vorderman), Borneo and Palawan. Celebes has been included within its range in virtue of two specimens from v. Rosenberg identified by Brüggemann at first with *Hermotimia porphyrolaema* (Wall.), (Abh. Ver. Bremen 1876, V, 73), but afterwards ascertained by him to be this species (in Shelley's Monogr. Nect. 89). Prof. W. Blasius (J. f. O. 1883, 158) received one of these specimens for examination and points out that it is labelled only "? Celebes". We consider the locality almost certainly erroneous.

GENUS ANTHREPTES Sw.

Bill a little longer than the cranium, or less, slightly decurved, keel of lower mandible straight, operculum of nostril naked; tail shorter than wing, square or slightly rounded; tarsus stout, with about 5 transverse scales. Form stouter and stronger than in the other *Nectariniidae* occurring in Celebes.

Ethiopian and Indian Regions as far as Sula.

188. ANTHREPTES MALACCENSIS (Scop.).

Brown-throated Sun-bird.

The most logical way of handling this species, with its puzzling intergrading local variations, seems to be to admit 3 subspecies where the more pronounced racial characters come to a head. The interconnecting races we prefer to indicate simply by a long hyphen connecting the names of the subspecies between which they lie. With the exception that we find them to be subspecies (according to the American definition) instead of species, the fair series in the Dresden Museum confirms the results of Capt. Shelley. The extremes seem to be:

The typical Anthreptes malaccensis: Tenasserim, Malacca, Sumatra, Borneo, Java as far as (?) Flores.

Anthreptes malaccensis celebensis (Shelley): Celebes and (fide Shelley) Sula.

Anthreptes malaccensis chlorigaster (Sharpe): Negros, with the birds of which locality those of Sangi (fide Shelley) are identical.

Perhaps the way in which these forms intergrade may be best shown by the following key to the adult males in the Dresden Museum:

The typical A. malaccensis

a. Under surface yellower.
- *a'.* Head above and mantle greener metallic bottle-green: Borneo, Nr. 6368.
- *b'.* Head above and mantle bluer metallic bottle-green.
  - *b''.* Throat drab: Java, Nr. 6364.
  - *c''.* Throat more rufous: Java, C 5504.
- *a'—b'.* Intermediate specimen: Sumatra, C 10262.

b. Under surface more olivaceous.
- *d'.* Size small: wing 66—71 mm, like that of *the typical A. malaccensis.*

A. malaccensis — chlorigaster
- *d''.* Head and mantle bluer; under surface yellower, less olivaceous; flanks yellower.
- *d'''.* Head and mantle as *d''*: Mindanao, C 9909.
- *e'''.* Head and mantle still bluer: Palawan, C 13747.

A. malaccensis celebensis
- *e''.* Head and mantle greener; under surface more olivaceous; flanks tinged with grey.
- *f'''.* Breast slightly less olivaceous: Banka Id. off Celebes, C 12221 and 12224.
- *g'''.* Breast slightly more olivaceous: Mantehage Id., C 12222 and 12223.
- *h'''.* Breast still more olivaceous, throat tinged with russet: Macassar, Nr. 8571 (type of *celebensis*).
- *f''—g'''—h'''.* Intermediate unclassifiable specimens: Manado tua C 12225, Minahassa Nr. 8575, Tombuku, E. Celebes Nr. 8576.

A. malaccensis chlorigaster
- *e'.* Size large: wing 70—77 mm.
- *i''.* Sides more olivaceous yellow; mantle bluer metallic bottle-green: Great Sangi, old ad. ♂ Nr. 8562.
- *j''.* Sides yellower; mantle greener: Siao, Nr. 8565.
- *i''—j''.* intermediate: Great Sangi Nr. 8561, C 12710; Siao Nr. 8566.

An additional select series of 6 adult males from East Celebes vary on the under surface from the much yellower tone of the form *chlorigaster* to an olivaceous tint darker than is usual in Celebes skins. Two from Banggai Island are dark below, but less dark than the latter specimen.

The largest specimens of *A. malaccensis celebensis* exceed the smallest of *A. malaccensis chlorigaster* of Sangi in size, and in colour there is no appreciable difference between Sangi specimens and those of Banka except the tinge of olive-grey on the flanks of the latter. Though the present species seems to be of a not exceptionably variable character in one and the same locality and some of the points of difference shown in the key above may be ascribed to differ-

ences of age, it is nevertheless practically certain that the almost unnoticeable marks of distinction which separate the Banka and Sangi birds will prove to fall within the extremes of individual variation of the races in either locality. The gap may be further filled up if the islands intermediate between Banka and Siao, i. e. Biarro and Tagulandang harbour this species. Links also between *Anthreptes malaccensis celebensis* and *A. malaccensis—chlorigaster* are pretty sure to be found in some of the Philippines. Sooloo furnishes birds between *the typical malaccensis* and *chlorigaster*: "Professor Blasius has referred the Sula bird to *A. chlorigaster*, and Dr. Guillemard to *A. malaccensis*. The specimens now sent by Mr. Everett appear to me to belong to the latter species. One specimen from Tawi Tawi is very like *A. chlorigaster*, but another from the same island cannot be distinguished from *A. malaccensis*" (Sharpe, Ibis 1894, 251). Here we see a case in which authorities find themselves, for want of a satisfying principle of nomenclature, compelled to call the same thing by different names, and we pity the feelings of a future writer on the history of the birds of Sooloo who — if he uphold binomial nomenclature unchanged — has to make up his mind which name to adopt. The name *Anthreptes malaccensis—chlorigaster* (Scop.—Sharpe) cannot offend any one except by its length. If it be objected that the Sooloo birds have really rather more to do with *the typical malaccensis* than with *chlorigaster*, then the sign *A. malaccensis* > *chlorigaster* or, if they approach most nearly to *chlorigaster*, the sign *A. malaccensis* < *chlorigaster* will serve to define them — the angle denoting something intermediate, its base being turned in the direction of the subspecies with which it has most in common, and its point in the direction of the other subspecies towards which its development tends. Not having sufficient material to take into full consideration *the typical malaccensis*, its racial variation in the direction of Flores and Sumba[1]), and all the forms interconnecting it with *chlorigaster*, and with only one specimen each (if correctly determined) of the species or subspecies *A. griseigularis* Tweedd. (Siquijor Id., North of Mindanao) and *A. rhodolaema* Shelley (Sumatra), we restrict this article to the two forms *A. malaccensis celebensis* and *A. malaccensis chlorigaster*.

The following is a general description of the species:

Anthreptes malaccensis (Scop.).

Adult male. Head above, hind neck and lower sides of neck, and mantle metallic bottle-green, with or without a violet gloss; lesser wing-coverts, lower half of back and upper tail-coverts glossy violet-blue (Royal purple); tail-feathers dusky, with metallic edges; quills dusky; lores, sides of head and upper sides of neck, middle and greater wing-coverts and edges of quills olive-green; a long submalar stripe metallic violet-blue, more bottle-green near base of bill;

[1]) That most conscientious worker, Mr. Hartert, finds himself reduced to calling the Bali bird *A. malaccensis*, the Sumbawa bird *A. malaccensis chlorogaster*, and the Sumba one *A. malaccensis celebensis*! (Nov. Zool. 1896, 545, 567, 581).

chin, throat and jugulum russet-brown or drab; remaining under-parts impure yellow, greyer towards the under tail-coverts, and more or less deeply tinged with olive according to locality (Java Nr. 6364, Celebes Nr. 8575, Great Sangi Nr. 8562).

Female. With no metallic parts in the plumage: above greenish olive, head greyer; below pale grey, more or less strongly washed with ochre-yellow on breast, sides, abdomen and under tail-coverts (Macassar Nr. 8569, and others).

Young. Like the female, but washed above and below more strongly with yellow, not grey (Limbotto Nr. 8573, Java Nr. 6366).

1. Anthreptes malaccensis celebensis (Shelley).

a. **Nectarinia lepida** pt. *(1)* Müll. & Schl., Verh. Natuurk. Comm. Aves 1846, 63; *(2)* S. Müll., Reize Ind. Archip. 1858, pt. II, 13.

b. **Anthreptes lepida** *(1)* Wall., P. Z. S. 1862, 343 (Cel., Sula).

c. **Anthreptes malaccensis** *(1)* Wald., Ibis 1870, 47; *(2)* id., Tr. Z. S. 1872, VIII, 70; *(3)* Brüggem., Abh. Ver. Bremen 1876, V, 72; *(4)* Lenz, J. f. O. 1877, 375.

d. **Antothreptus malaccensis** pt. *(1)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 661 (nec Siao).

e. **Anthothreptus malaccensis** *(1)* Salvad., Atti Ac. Sc. Tor. 1877, XII, 320 (Celebes).

f. **Anthreptes celebensis** *(1)* Shelley, Monogr. Nect. p. XLIV, 321, pl. 103, fig. 2 (♂), 3 (♀) (1878); *(2)* Meyer, Ibis 1879, 131, 146; *(3)* W. Blas., J. f. O. 1883, 114, 137; *(4)* Salvad., Ibis 1884, 325; *(5)* W. Blas., Ztschr. ges. Orn. 1885, 284; *(6)* id., Ornis 1888, 587; *(7)* Büttik., Zool. Erg. Weber's Reise in Ost-Ind. 1893, III, 278.

g. **Anthothreptes malaccensis** pt. *(1)* Gadow, Cat. B. IX, 1884, 123; *(2)* Tristr., Cat. Coll. B. 1889, 215.

h. **Anthothreptes celebensis** *(1)* Guillem., P. Z. S. 1885, 554; *(2)* Hickson, Nat. in N. Celebes, 1889, 92.

h^{bis}. **Anthreptes malaccensis celebensis** *(1)* Meyer, Abb. v. Vogelskel. 1894, II, t. CCVIII; *(1bis)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 11; *(2)* iid., ib. 1896, Nr. 1, p. 11; *(3)* iid., ib. 1896, Nr. 2, p. 17; *(4)* Hart., Nov. Zool. 1896, 153; *(5)* id., ib. 1897, 161.

"Burong tjui" (chuwi), Malay (for all *Nectariniidae*), Meyer *f 2*, Guillem. *h 1*, Hickson *h 2*.

"Burong tjui kalapa", Malay, Minahassa, Nat. Coll.

"Tomonsi niu", East Celebes; **"Tomonsi cosoni"**, Peling, iid.

"Tomonsi babal", Banggai, iid.

For further references see Shelley *f I*.

Figure and descriptions. Shelley *f 1*; Meyer *h^{bis} I* (skeleton); Salvadori *d 1*; W. Blasius *f 5*, *f 6*.

Diagnosis. Male adult. Breast strongly washed with olive; lower sides, flanks and under tail-coverts washed with olive-grey; size not large (Macassar, ♂ ad., Jan. 1873: Meyer — Nr. 8571, type of subspecies).

Iris red; feet greyish green, soles yellow, claws grey; bill black.

Female. Below pale olive-grey, hardly washed with yellow; chin and throat whitish; head above and neck strongly tinged with grey (Kema, ♀, 8570; Macassar, ♀, 8569; Togian, ♀, 8574).

Young. Like the adult female, but the bill shorter and not black, the head above and neck (like the mantle) yellowish olive not washed with grey; chin and throat olivaceous whitish, the under-parts strongly washed with ochre-yellow (Limbotto, ♀♀ juv., July, Nr. 8572 and 8573).

Skeleton.

Length of cranium	31.5 mm	Length of tarso-metatarsus	15.0 mm
Greatest breadth of cranium	12.0 »	Length of digitus I	10.3 »
Length of humerus	15.7 »	Length of digitus II	9.0 »
Length of ulna	19.0 »	Length of digitus III	13.0 »
Length of radius	17.0 »	Length of digitus IV	11.0 »
Length of manus	17.0 »	Length of sternum	16.7 »
Length of metacarpus	9.0 »	Greatest breadth of sternum	9.5 »
Length of digitus I	3.6 »	Height of crista sterni	5.6 »
Length of digitus II	8.2 »	Length of coracoideum	15.0 »
Length of digitus III	2.1 »	Length of scapula	16.0 »
Length of femur	13.5 »	Length of clavicula	14.0 »
Length of tibia	23.0 »	Length of pelvis	19.0 »
Length of fibula	8.0 »	Greatest breadth of pelvis	11.0 »

Eggs. "Dr. Platen sent me a sitting of two eggs of this bird from Rurukan in the Minahassa. They measure 18 × 13.5 mm. The ground-colour is whity-grey, the ground-spots which are distributed over the whole egg are blue-grey. The few superjacent spots are deep black-brown, and amongst them are found a few fine hair-streaks. A circlet of spots is not present; so, too, there is no gloss. The eggs resemble those of *A. malaccensis* in my collection from Borneo" (Nehrkorn MS.).

Nest. Four nests in the Dresden Museum belonging to this subspecies much resemble those of the Celebesian *Cyrtostomus frenatus*, but have little or no caterpillar excrementa on the outside and are without feathers in any part. A pendant pear-shaped structure of strips of bark, bits of straw, dead leaf, grasses, the long down of seeds, held together with grass-fibres and web of caterpillars or spiders, lined with finer grasses and seed-down or sometimes a little wool; length 115—150 mm, breadth 60—75; no waste stuff hanging from the bottom; entrance at the side in the upper half, slightly hooded (Manado — Nrs. 131, 132, 129, 134).

Distribution. Celebes and the islands off the coast, and Sula: Manado tua, Mantehage and Banka (Nat. Coll. in Dresd. Mus.), Talissi (Hickson *h 2*), Minahassa (Wallace *g 1*, Meyer *f 2*, etc.), Gorontalo Distr. (Meyer *f 2*, Guillemard *h 1*), W. Celebes (Doherty h^{bis} *5*), Togian (Meyer *f 2*), E. Peninsula (Ribbe and Nat. Coll. in Dresd. Mus.), Kandari, S. E. Peninsula (Beccari *d 1*), Buton Id. (S. Müller *a 2*), S. Peninsula (Wallace *g 1*, Meyer *f 2*, Platen *f 5*, Guillem. *h 1*, Weber *f 7*, etc.), Sula Islands (Allen *b 1*, *f I*, *g 1*), Peling and Banggai (Nat. Coll. h^{bis} *3*).

Observation. From Sula only a single female specimen in the British Museum has been definitely recorded *(g 1)*. The Flores specimens, obtained by Wallace, Capt. Shelley remarks after the publication of his article on *A. celebensis*, "I am now convinced should belong to this species" (Introd. p. XLV); their perfect identity with it appears to us, however, doubtful. Büttikofer (Notes L. M. 1892, 194, 201; Zool. Erg. Weber's Reise III, 300) does not unite his Flores and Sumba specimens with *celebensis*, but with *malaccensis*. Hartert identifies Sumba birds with those of Celebes, but not so Sumbawan birds. If they lie midway between these two races, they may be indicated as *A. malaccensis — celebensis*, or, if they represent a new line of departure, some other method of nomenclature must be found.

Of the voice, habits etc. of *A. celebensis* nothing peculiar is known, and it is hardly likely that they differ much from those of the *typical* form.

2. Anthreptes malaccensis chlorigaster (Sharpe).[1])

i. **Antothreptus malaccensis** pt. *(1)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 661 (Siao).

j. **Anthothreptes malaccensis** *(1)* Salvad., Ann. Mus. Civ. Gen. 1876, IX, 57 (Gt. Sangi); *(2)* Gadow, Cat. B. IX, 1884, 123, partim (Negros).

k. **Anthothreptus malaccensis** pt. *(1)* Salvad., Atti Ac. Sc. Tor. 1877, XII, 320 (Sangi).

l. **Anthreptes chlorigaster** *(1)* Sharpe, Tr. Z. S. 1877, I, 342 (Negros); *(2)* W. Blas., Ornis 1888, 585 (Gt. Sangi).

m. **Anthreptes chlorigastra** *(1)* Shelley, Monogr. Nect. p. XLV (Negros, Cebu), 321, pl. 103, f. 1 (Gt. Sangi) (1877).

n. **Anthothreptes chlorogastra** *(1)* Tweedd., P. Z. S. 1877, 756, 763 (Cebu?).

o. **Anthothreptes chlorigaster** *(1)* Tweedd., P. Z. S. 1878, 287 (Negros); *(2)* Steere, List Coll. B. & M. Philipp. Is. 1890, 23 (Negros, Masbate); *(3)* Bourns & Worces., B. Menage Exped. 1894, 38.

p. **Anthotreptes chlorigaster** *(1)* Meyer, Isis, Dresden 1884, 6, 38 (Siao, Gt. Sangi).

Figure and descriptions. Shelley *m I*; Salvad. *j 1*; Sharpe *l 1*; W. Blas. *l 2*.

Diagnosis. Adult male: Size large (wing 70—77 mm); under surface greener yellow than in the *typical* form, less olivaceous than in *celebensis*; head and mantle metallic bottle-green, without, or with hardly any, violet intermixed.

Iris blood-red (Platen *l 2*).

Adult female? Larger than the female of *celebensis* and of the *typical* subspecies; underparts from breast downwards strongly washed with olive and olive-yellow; chin and throat whitish olive-grey (Siao, Nr. 8567, C 382; Gt. Sangi, C 12709).

Iris red-brown (Platen *l 2*).

Young. Like the adult female, but the under surface greener yellow, the chin and throat washed with the same colour, and the head above not tinged with grey (Siao, C 8568).

Observation. From analogy with the Celebes race we hold the specimens with pale grey throats and greyish olive heads for females, and the one described without grey on these parts for a bird of the year. The feather-structure of this specimen, which is mentioned by Shelley, also appears immature. Prof. W. Blasius mentions two females as distinguishing themselves by a yellower colour on the chin and throat, but for the above reason we believe these to be only young females.

Nest? See under *Hermotimia sangirensis*.

Distribution. Philippine Islands (Steere *l 1*, Everett *o 1*, etc.); Great Sangi (Meyer *m I*, Bruijn *k 1*, Platen *l 2*, Nat. Coll.); Siao (Meyer *m I*, *p 1*).

Remark. Sangi specimens were compared by Capt. Shelley with one of the two type specimens from Negros and considered by him to be perfectly identical.

Arachnothera longirostris Müll. Schl. This species was recorded by Müller and Schlegel from Celebes, but confirmation of its occurrence there is wanting;

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[1]) The following references seem to belong to the intermediate *A. malaccensis—chlorigaster: Anthothreptes chlorogaster* Tweedd., P. Z. S. 1878, 951 (Mindanao); *Anthreptes chlorigastra* Shelley, Monogr. p. XLV pt. (Mindanao); *Anthreptes chlorigaster* W. Blas., J. f. O. 1890, 139 (Sooloo); (?) *A. mal. chlorogaster* Hart., Nov. Zool. 1896, 567 (Sumbawa). It is a little to be regretted that ornithologists have seen fit to alter the spellings of the generic and specific names of this species in the way they have done; science does not profit by such shufflings, nor classical learning, it may be, to any great extent either. For the genus we have: *Anthreptes, Antothreptus, Anthothreptes, Anthothreptus* and *Anthotreptes;* for the species *chlorigaster, chlorigastra, chlorogastra* and *chlorogaster.*

we regard this record as most probably erroneous. The species ranges from India to Borneo and Java (Shelley). The following references indicate the occurrence of the species in Celebes, the authors being guided by Müller and Schlegel, without referring to further proof.

a. **Arachnothera longirostra** *(1)* Müll & Schl., Verh. Natuurk. Comm., Zool. Aves 1846, 69 (Celebes); *(2)* Blyth, Cat. B. Mus. A. S. B. 1849, 222 (Cel.); *(III)* Shelley, Monogr. Nect. p. L, 357, pl. (1878), (Cel.); *(4)* W. Blas., J. f. O. 1883, 115.

b. **Arachnothera —?** *(1)* Wald., Tr. Z. S. 1872, VIII, 70.

c. **Arachnocestra longirostris** *(1)* Rchb., Hb. sp. Orn., Scansoriae 1853, 315 (Cel.).

d. **Arachnothera longirostris** *(1)* Gadow, Cat. B. IX, 1884, 103 (Cel.); *(2)* Sharpe, Ibis 1890, 279 (Cel.).

For synonymy and further references cf. Shelley *a III*, Gadow *d 1*.

FAMILY MELIPHAGIDAE.

The Honey-suckers vary in size from about that of a Wren to that of a Jay; they are birds of plain plumage, metallic tints and blue are wanting, red is found only in *Myzomela*; the bill is generally decurved, often very long and slender, the nostril longitudinal covered with a coriaceous operculum, "or oval and situated in front of a coriaceous groove" (Gadow); in some forms the tomia are serrated. The tongue is protractile, bifid, and furnished with peculiar brush-like fibres on the tip. The family is almost exclusively peculiar to the Australian Region.

GENUS MYZOMELA Vig. Horsf..

The characteristics of the genus by W. A. Forbes are given below. They are very small birds, most of them differing from all other *Meliphagidae* by having red in the plumage. The edges of the mandibles are serrated.

* 189. MYZOMELA CHLOROPTERA Tweedd.

Scarlet Honey-sucker.

Myzomela chloroptera *(1)* Wald., Ann. & Mag. N. H. 1872, (4) IX, 399; *(2)* id., Tr. Z. S. 1872, VIII, 117; *(3)* Meyer, J. f. O. 1873, 405; *(4)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 662; *(5)* Brüggem., Abh. Ver. Bremen V, 1876, 74; *(VI)* W. A. Forbes, P. Z. S. 1879, 260, pl. XXIV, fig. 1; *(7)* Meyer, Ibis 1879, 132; *(8)* Gadow, Cat. B. IX, 1884, 132; *(9)* Salvad., Ibis 1884, 326; *(10)* Büttik., Zool. Erg. Weber's Reise Ost-Ind. 1893, III, 279; *(11)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 11; *(12)* Hart., Nov. Zool. 1896, 153, 168; *(13)* id., ib. 1897, 157.

Figure and descriptions. Forbes *VI*; Walden *1*; Salvadori *4* (? = ♂, not ♀); Brüggem. *5* (? = ♂ not ♀); Gadow *8*.

Adult male. Upper surface, entire head, throat and breast scarlet-poppy-red; scapulars, wings and tail-feathers black, the greater wing-coverts and quills edged with ochra-

ceous; sides, abdomen and under tail-coverts greyish brown, washed with fulvous; under wing-coverts and inner edging of quills white. (♂, Rurukan Minahassa, 14. VIII. 84: Platen in Mus. Nehrkorn, Nr. 952). Iris brown; bill black; feet grey (Platen).

Female. Smaller than the male. Above olive-brown, rather brighter on the forehead and rump; wings and tail blackish, with warm brown margins to the feathers; chin and ear-coverts brown, touched up with scarlet; throat drab-brown, becoming darker and more olivaceous on the breast, and paling into brownish buff on the remaining under-parts; under wing-coverts and basal part of inner webs of quills white. (♀, Rurukan, 25. IX. 94: Sarasin Coll.)

"Legs and feet grey, the latter below yellowish; bill black, base of lower mandible yellow; iris dark" (P. & F. S.).

Remark. A specimen in adult male dress, but labelled as a female, is described by Salvadori *(4)* who believes the sex indicated to rest upon an error; and the same seems to be the case with the bird described as a female by Brüggemann, a specimen in nearly adult male dress.

Young male. Like the female (♂, Djampea, XII. 95: Everett — C 15149).

Measurements.	Wing	Tail	Tarsus	Bill from feath. of forehead
a. (Mus. Nehrk. Nr. 952) ♂ ad. Rurukan	54	37	13	14
b. (Mus. Nehrk. Nr. 953) [♀] Rurukan	51	38	14	13
c. (Nr. 1974) [♂] ad. Minahassa	57	37	14	—
d. (C 418) [♂] ad. Manado, III. 71	59	40	15	—

Three additional adult males from the Minahassa in the Sarasin Coll. have the wing 56—57 mm; two females, wing 52, 53; one ♂ ad. Loka, S. Cel. (Sarasin Coll.) wing 56; one ♂ ad. Saleyer Id. (Ev. C 15147) wing 55; one ♀, Saleyer, wing 52.

Variation. From North Celebes two of the adult males in the Sarasin Collection in good fresh plumage (March) have the wing-coverts, scapulars and tail sooty blackish, a little browner in the one than in the other. The third male, probably less adult, but also in more worn plumage (October), has the wing-coverts, scapulars and tail browner. Another adult male (C 418) in worn plumage (March) is more sooty than the last.

South Celebes. The adult male in the Sarasin Collection is in slightly worn plumage (Loka, October). The colour of the wing-coverts, scapulars and tail cannot be termed sooty, but dull dark sepia.

Saleyer. A male in good plumage (Nov.) is slightly sooty and a shade darker than the above South Celebes male on the parts in question, and about as dark as the palest example from North Celebes. A female in worn plumage (Nov.) is much paler and greyer above and paler below than two females from N. Celebes.

Djampea. A young male in changing plumage (Dec.) is very much darker above, being darker than the females from N. Celebes.

Distribution. Celebes and the islands to the south: Minahassa (Meyer *1*, *7*, Bruijn *4*, Fischer *5*, Platen, Sarasins *11*); S. Peninsula — Bonthain Mts. (Weber *10*, Everett *12*, Sarasins, Doherty *13*); Saleyer and Djampea (Everett *12*).

This Honey-sucker has as yet been found only at the two extreme ends of the Island of Celebes; it was discovered by Meyer in the Minahassa in the north, in which district only a small number of specimens have been obtained, and now recently it has turned up at Loka near Bonthain at the extremity of

the Southern Peninsula, where Prof. Weber first got a single example, to be followed by others from the Sarasins, Everett, and Doherty. It is clearly a mountain species, and it seems to vary racially. Its nearest affinities seem to be with *M. sanguinolenta* (Lath.) of Australia, a bird of larger size, with the red colour extending further down the chest and the abdomen greyer.

Myzomela is a well-marked and purely Australasian genus, occurring in Australia, the island-groups of Central and North-western Polynesia, Papuasia, the Moluccas, Timor and Celebes. One of the most remarkable facts connected with the geographical distribution of birds in Celebes, which is not controverted by the present species, is that, when a bird's nearest affinities are with Australian or Timor species, the said bird is always found inhabiting the Southern Peninsula of Celebes, though not always the Northern; but, when the bird's nearest affinities are with species of Sangi, the Philippines, or the Moluccas, it is always found in the north of the island, though not always in the south. A correct explanation why this is so will clear up much that is puzzling in the study of the geographical distribution of the birds of our Province.

The *Meliphagidae* are interesting for the peculiar structure of the tongue, which Dr. Gadow characterizes as "protractile, bifid, each half broken up into numerous stiff horny fibres, so as to form a brush". *Myzomela* itself has been ably handled by W. A. Forbes (P. Z. S. 1879, 256—278 — a synopsis of the genus), and we cannot do better than repeat the general remarks of this investigator on the genus. "*Myzomela* is characterized by its *Meliphagine* tongue, rather short [about as long as the head], narrow, and slender curved bill, which is depressed and broadened at the base, rounded and compressed anteriorly, and there finely serrulated on its cutting margins. The nostrils are linear and curved, extending for almost one third of the length of the bill, and covered in by a conspicuous opercular membrane. The wings are moderately long, the 'first' primary short, the 3rd to 5th longest and subequal, the 6th longer than the 7th, which about equals the 2nd. The tarsi are about as long as the bill, rather slender, and covered with 6—7 scales in front, the lower ones being the smallest and transverse. The second and fourth toes are very slender, about equal in length, and shorter than the third. The hallux is unusually stout for the size of the bird. The tail has 12 feathers, is short and nearly square".

"Most species have more or less red in their plumage (not seen in any other *Meliphagine* genus); but this colour is altogether absent in some, and becomes only a slight tint confined to the margins of the feathers, particularly of the head, wings, and tail, in others. As yet our knowledge of the phases and changes of plumage is by no means perfect . . . The eggs seem to be generally whitish or buff, spotted with darker, red or yellow. According to Gilbert (Gould, Handb. B. A. I, 558) *M. nigra*, like many other species of *Meliphagidae*, lays only two eggs [and two, seldom three, are also laid by *M. sanguinolenta*: North, Nests and Eggs B. A. 222]. The nests are small and

cup-shaped, rather flimsily constructed of grass-stems, hair, spiders' webs, etc. and often placed in the fork of a tree or bush. In their habits the *Myzomelae* seem to resemble the other small Honey-suckers, frequenting flowering shrubs and trees, not apparently so much for the sake of the nectar of the flowers as for the insects attracted thereby".

GENUS MELILESTES Salvad.

Bill about twice as long as the cranium or more, decurved, culmen high and sharp, bill as high as broad across the nostrils; nostrils linear, imperfectly operculated; tomia terminally serrated, somewhat irregularly; wing longer than tail, 1st primary short, 2nd primary about as long as the secondaries; tail square; tarsus about $^1/_4$ the wing-length, or a little more.

Found in Papuasia and Celebes.

* 190. MELILESTES CELEBENSIS M. & Wg.

Brown Honey-sucker.

Plate XXVIII.

This very distinct species is known at present only from the mountains of the north and of the south of Celebes, where it differs racially, but it is not advisable to divide it into two species, as the difference is only a question of shades of colour, which are almost certain to be found to merge into one another in some intermediate part of Celebes.

1. The typical Melilestes celebensis.

a. **Arachnothera? celebensis** *(1)* M. & Wg., Abh. Mus. Dresd. 1894—95, Nr. 4, p. 2.

b. **Melilestes celebensis** *(1)* M. & Wg., t. c. Nr. 8, p. 12; *(2)* Hart., Nov. Zool. 1896, 237.

Diagnosis. Lighter in colour; general colour above almost dark tawny-olive with black centre-streaks; below greyish sepia, with buff-brown to buff edges to the feathers.

Adult. Above dark greenish tawny-olive, with blackish mesial streaks to the feathers; wings and tail blackish, with edgings of the colour of the back, or, on the primaries, lighter; below greyish sepia, with broad margins to the feathers of brownish buff, or light tawny-olive, becoming whiter on the abdomen; flanks and thighs more uniform tawny-olive; remiges below dusky, the inner edges where they rest upon the body light fawn-colour, deeper on under wing-coverts, some of which are slightly streaked (♂, c. 1200 m from the declivity of Mt. Manimporok towards the Soputan Ridge, N. Celebes, 22. April, 1895: P. & F. Sarasin: C 15690).

"Bare skin around the eye light yellowish, posteriorly rather darker yellow" (S.).

Female. Similar to the male, but smaller. "Bill black; feet and legs grey, feet below yellow; iris brown; bare skin round the eye yellow" (♀, type, Bone Mts. 1100 m, 15. Jan., 1894: P. & F. S.).

Measurements.	Wing	Tail	Tarsus	Bill from nostril
a. (C 15690) ♂, G. Manimporok c. 1200 m	86	70	20.5	19
b. (Sarasin Coll.) ♀, type, Bone Mts. 1100 m	77	66	19.5	18
c. (Sarasin Coll.) ♀, G. Mantinang, 1500 m	74	63	18	—

Distribution. Mountains of North Celebes: Gunong Manimporok in the Minahassa, Bone Mts. in the Gorontalo District, and Gunong Mantinang near Buol (P. & F. S.).

2. Melilestes celebensis meridionalis M. & Wg.

c. **Melilestes celebensis meridionalis** *(1)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 11; *(2)* Hart., Nov. Zool. 1896, 153; *(3)* id., ib. 1897, 157.

Diagnosis. Darker; dark greyish olive above, with black centre-streaks; below greyish sepia, with the light margins of the feathers less pale and distinct. "Iris dusky brown; bare orbital skin white" (P. & F. S.).

Measurements.	Wing	Tail	Tarsus	Bill from nostril
a. (Sarasin Coll.) ♂, type, western declivity of the Peak of Bonthain ca. 1500 m, 2. XI. 95	85	73	21.5	19
b. (Sarasin Coll.) ♀, ibid.	82	71	20	18
c. (Sarasin Coll.) ? juv., ibid.	74	63	18	16.5
d. (C 14888) ♂, Bonthain Peak, 6000 ft., Oct. 95 (Everett)	85	71	20.5	19.5
e. (C 14889) ♀, Bonthain Peak, 6000 ft., Oct. 95 (Everett)	78	65	19	18

Distribution. South Celebes — Bonthain Mountains (P. & F. Sarasin *c 1*, Everett *c 2*, Doherty *c 3*).

This mountain-haunting Honey-eater was one of the most interesting of the discoveries of the Sarasins in Celebes. Its nearest affinities seem to be with *Melilestes megarhynchus* of New Guinea and the neighbouring islands, a species of somewhat similar, but more uniform brown, coloration, with a much larger bill, similarly serrated (the serrations being more perfect in some specimens than in others), with the nasal operculum narrower at the base, and the frontal feathers not encroaching upon it. The foot and tarsus is, as Hartert points out, smaller and more delicate in the Celebes form, the tarsus is indeed about $^1/_4$ the length of the wing and longer than the middle toe, while in *Melilestes megarhynchus* the tarsus is about $^1/_{10}$ longer and equal to the middle toe; the space of bare skin behind and above the eye is also peculiar to the Celebes form. Still, it appears to us to stand as near (or nearer) to the typical *Melilestes* as does *M. iliolophus* and its allies, and it would be disadvantageous to bury its affinities under a new generic name.

GENUS MYZA M. & Wg.

Bill longer than the cranium, the tomia not serrated, but slightly turned inwards, a slight subterminal notch; the nostril linear, with an operculum, on the basal part of which the feathers of the forehead impinge; behind the eye

and above the ear-coverts a patch of bare skin; tail of 12 feathers, nearly as long as the wing, graduated, the outermost rectrix about 2 cm shorter than the middle ones, each feather terminally narrowed to a sharp point; 1st primary more than half as long as the 2nd, the 2nd longer than the secondaries, the 4th and 5th longest, the shafts of all the remiges, except the 1st and 2nd, terminally projecting as a minute point or thorn (seen likewise in the genera *Melipotes*, *Leptornis*, and others); tarsus longer than the middle toe and claw, 9 transverse scales on it; the first and second joints of the fourth toe united to the basal joint of the third toe, as in all *Meliphagidae*.

The genus is known only from Celebes. Its most peculiar characters are the tail, the patch of bare skin on the cheek, and its *Myzomela*-like, but unserrated, bill.

* 191. MYZA SARASINORUM M. & Wg.

The Sarasins' Honey-sucker.

Plate XXVIII.

Myza sarasinorum *(1)* M. & Wg., Abh. Mus. Dresden 1895, Nr. 8, p. 11.

Male. Head and neck dark slate, with blackish centres to the feathers and almost pure black on the superciliary and malar regions, becoming more umber-brown with blackish centre-streaks on the back, and almost uniform dark umber on the lower back and upper tail-coverts; wings and tail blackish, with external edgings of umber; under parts reddish umber, the upper breast with blackish centre-streaks, becoming blacker with greyer borders on throat and chin; under wing-coverts reddish umber; remiges and rectrices below shining dusky; behind the eye a large bare patch ("colourless, i. e. pale, without pigment"); bill blackish; legs and feet dark (♂, Gunong Mantinang, south side, c. 1800 m, 29. VIII. 94: Sarasin Coll., type).

Measurements. Wing 89 mm; tail 82; tarsus 24; culmen from suture 25.5, from nostril 14.2.

Distribution. Mantinang Mountains, North Celebes (P. & F. Sarasin).

The type of this peculiar species and genus of Honey-sucker is at present the only specimen known. It was obtained by the cousins Sarasin at the high altitude of about 6000 ft. during their expedition across the North Peninsula from Buol on the north coast to the Gulf of Tomini.

The affinities of this bird are somewhat uncertain. Except that its bill is smaller and not serrated, it agrees herein with *Melilestes*, but differs by its longer graduated tail of pointed feathers (see plate). The Papuan *Melipotes* has the rectrices similarly pointed, but not graduated, and similarly much bare skin on the face, but its bill is short, like a Thrush's. Bare skin on the face is found in several other Meliphagine genera, such as *Xanthotis*, *Melirrhophetes* and some species of *Ptilotis*.

Until Drs. P. & F. Sarasin, Mr. Everett, and Mr. Doherty went to Celebes it was not known that the high mountains harboured so many interest-

ing and peculiar forms, not to be found on the coast, and the work of exploring these hills does not yet appear to be even half done.

FAMILY ZOSTEROPIDAE.

It appears best to make a family of the great genus of the White-eyes, *Zosterops*, some 125 species of small birds which have been placed by Gadow among the *Meliphagidae* as a subfamily, by Oates among the *Crateropodidae*, by others (fide Newton) among the *Paridae*, and by others with the *Nectariniidae*, which is enough to show how uncertain their affinities are. One of Mr. Everett's recent discoveries in Celebes, *Zosterops squamiceps* (Hart.), looks as if it has affinities with the *Meliphagidae*. *Yuhina* among the *Crateropodidae*, and *Anthreptes* among the *Nectariniidae* also call for comparison.

The *Zosteropidae* have only nine primaries, or a very minute tenth. The muscles of the tongue resemble those of *Nectarinia*, with some differences; the tongue itself ends in two short filaments, and has not a brush-tip (Gadow, P. Z. S. 1883, 63, 68). A striking characteristic in almost all the species is a ring of minute white feathers round the eye — whence the name, White-eye. Olive, yellow, and grey are the chief colours; red and blue are not found.

Zosterops, separated as a family by Sharpe, is widely distributed in Africa south of the Sahara, Asia south of the Himalayas and Amoor, the islands of the Indian Ocean, the East Indies to Australia, the western islands of the Pacific, south to New Zealand and the Chatham Islands. These birds have almost certainly spread their range by flight, a case of which has taken place within the memory of man (Buller, B. N. Zeal. 2nd ed. 1888, I, pp. 79—81).

There seems to be no explanation but that of distribution by flight for the presence of closely allied forms in, for instance, North Celebes and Liberia, or on many islands of Polynesia, which are of volcanic or coral origin, and where animals which cannot fly or otherwise make sea-voyages, such as the larger mammals, are unknown.

GENUS ZOSTEROPS Vig. Horsf.

Culmen about as long as the head, or less, slightly decurved, keel of lower mandible approximately straight; nostril linear, with an operculum basally feathered; a periocular ring of minute white feathers usually present; tail square, shorter than wing; first primary very minute or wanting, the next as long as the secondaries or longer, tip of wing formed by the next four feathers; tarsus longer than middle toe and claw; 4th toe united with 3rd to the first joint of the latter. See, also, *supra*, *Zosteropidae*.

* 192. ZOSTEROPS SQUAMICEPS (Hart.).

Aberrant White-eye.

Plate XXIX.

a. **Chlorocharis squamiceps** *(1)* Hartert, Nov. Zool. 1896, III, 70; *(2)* id., t. c. 153.
Zosterops squamiceps *(1)* Hart., Nov. Zool. 1897, 157.

Adult. Above olivaceous green, brighter on rump and wing-edgings; feathers of head above blackish with whitish shaft-streaks and terminal edges of silvery grey, forehead slightly olivaceous; lores olive whitish; a small space below and behind the eye bare, around the eye a thin ring of minute white plumulae; ear-coverts silvery grey with a yellowish gloss; chin and throat greyish white, with blackish subterminal edges to the feathers; remaining under parts yellowish olive-green, greyer on sides of breast, clearing to sulphur-yellow on middle of lower breast, on abdomen and under tail-coverts; under wing-coverts whitish; "bill black, feet brown" (Hartert *1*); wing 66 mm; tail 49; tarsus 20; middle toe and claw 17; bill from nostril 9.5 (♂, Pasoso, Bonthain Peak, 6000 feet, Oct. 1895: Everett — C 14890).

Female or immature. Head above more olive-brown, the silvery grey terminal edgings not extending beyond the crown, all the feathers of head above with blackish subterminal edgings; breast browner, yellow of under parts less extensive (♀, label as in ♂, C 14891). Possibly this example is immature, as Mr. Hartert *(1)* says there seem to be no sexual differences.

Distribution. South Celebes — Mount Bonthain (Everett *a 1*, *a 2*, Doherty *1*).

One of the best of the discoveries of Mr. Everett in South Celebes is the present species, which came into the careful hands of Mr. E. Hartert, who detected its true relationships. At first sight its affinities are not apparent; this is due to the peculiar squamous appearance of the feathering of the head. But, put a similar squamous head on *Zosterops javanica* (Horsf.), and you have *Z. squamiceps* (Hartert)! A form perhaps still more nearly allied is *Zosterops squamifrons* Sharpe, described from Mt. Dulit, Borneo, which, as its name betokens, has a squamous appearance on the forehead. In some ways *Zosterops squamiceps* recalls certain of the Honey-eaters, for instance, *Glycyphila*, but it would be dangerous to speak of it as a possible connecting-link between the *Zosteropidae* and *Meliphagidae*, as its wing is that of a true *Zosterops*, and therefore quite unlike that of *Glycyphila*. Indeed, we cannot find any point of structural difference capable of description by which *Z. squamiceps* may be separated from other species of *Zosterops*; it also has the white periocular ring, though this is inconspicuous.

A form of *Zosterops*, more aberrant in our opinion than *Z. squamiceps*, is the bird named by Dr. Sharpe *Chlorocharis emiliae*. In describing it Sharpe (Ibis 1886, 392, pl. XI) overlooked its true affinities and made it a new genus of the *Timeliidae*, standing near *Cyanoderma* and *Mixornis*; with these however, as Hartert remarks, it has "no resemblance in the wing-formula, no resemblance in the structure of the plumage, nor any in coloration, form of tail, etc. In fact the structure almost entirely agrees with that of the genus *Zosterops*". The

chief differences appear to be the more elongated nasal aperture and more delicate bill, the periocular ring of black, and the larger size. *Z. squamiceps* seems to us to lie about midway between this form and the typical *Zosterops*, so that, if the genus *Chlorocharis* be allowed to stand, it becomes very difficult to say to which genus Everett's new White-eye should be referred.

193. ZOSTEROPS INTERMEDIA Wall.

Yellow White-eye.

Zosterops intermedia *(1)* Wall., P. Z. S. 1863, 486, 493; *(2)* Hartl., J. f. O. 1865, 16; *(III)* Wald., Tr. Z. S. 1872, VIII, 72, pl. IX, f. 2; *(4)* Rosenb., Malay. Archip. 1878, 272 (incl. also *Z. chloris*); *(5)* Meyer, Ibis 1879, 132; *(6)* Salvad., Orn. Pap. II, 1881, 369; *(7)* W. Blas., J. f. O. 1883, 125; *(8)* Sharpe, Cat. B. IX (gen. *Zosterops*) 1884, 185; *(9)* Guillem., P. Z. S. 1885, 555; *(10)* Büttik., Zool. Erg. Weber's Reise Ost-Ind. 1893, III, 279; *(11)* Vorderm., N. T. Ned. Ind. 1895, LIV, 341; *(12)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, pp. 12, 16; *(13)* Hart., Nov. Zool. 1896, 153, 168, 557, 567, 594; *(14)* id., ib. 1897, 157, 161.

a. **Zosterops brunneicauda** *(1)* Guillem. (nec Salvad. fide Hart.), P. Z. S. 1885, 508.

For further references cf. Salvadori *6*, Sharpe *8*.

Figure and descriptions. Walden *III*; Wallace *1*; Hartlaub *2*; Salvadori *6*; Sharpe *8*.

Male. Above yellow olive-green, yellowest on head and tail-coverts; bastard-wing, quills and tail-feathers dusky brown, the quills edged with the colour of the back but yellower, greyish towards the distal ends of the primaries; lores and forehead next base of bill yellow; orbital ring white; below this a suborbital streak blackish; chin and throat lemon-yellow; remaining under-parts less pure yellow, washed on sides of breast, sides and flanks with olive; thighs sulphur-yellow; under wing-coverts straw-yellow, metacarpal edge darker, inner edges of quills below yellowish white (♂, Macassar, Jan. 1873: Meyer — C 453).

Bill grey, bluish below; feet and claws greyish blue (M. *5*); Iris olive-brown or sepia (Wallace *1*, P. & F. S., etc).

Female. An adult female (♀, Macassar, Jan. 1873 — C 493) is like the specimen described, but yellower olive-green above, the yellow on the lores and forehead a little more extended, the chin and throat similar lemon-yellow, the other under-parts purer sulphur-yellow than in the first. It is possible that that specimen and another nearly similar male in the Dresden Museum (C 452) are not quite fully adult.

Young. Like the adult, but darker above, greyish in tint on the hind neck; chin, throat and abdomen and under tail-coverts pale sulphur-yellow, the sides pale olive-grey, yellower on the flanks (♀ juv. Macassar, Jan. 1873: Meyer — C 451).

Measurements.	Wing	Tail	Tarsus	Bill from nostril
a. (C 453) ♂, Macassar, I. 73	57	44	18	7
b. (C 452) ♂, Macassar, I. 73	54	39	17	6.5
c. (C 493) ♀ ad. Macassar, I. 73	56	41	16	7
d. (C 451) ♀ juv. Macassar, I. 73	54	40	17	6.5
e. (Sarasin Coll.) ♂ ad. Sosso, S. W. Centr. Cel., 11. VIII. 95	56	40	18	7.5
f. (Sarasin Coll.) ♂ juv. Macassar, 18. VI. 95	55	39	—	—
g. (Sarasin Coll.) ♂ ad. Bonerate Id., 30. XII. 94	56.5	40	19.5	7.75
h. (C 15171) ♂ ad. Lombok, 1500—2000 ft., May 96 (Ev.)	57	41	17.5	8

Variation. The specimen from Bonerate has a remarkably long tarsus. Hartert *(14)* considers his specimens from the Lesser Sunda Islands "mostly distinctly larger, with slightly larger beaks".

Egg. Rounded ovate, glossless whity blue, 15 × 13 mm (S. Celebes: Ribbe & Kühn — C 7996).

Nest. Two, South Celebes (Ribbe & Kühn, Nrs. 1552—53), light, shallow cup-shaped structures, calling to mind the nests of *Sylvia curruca* and *cinerea*, externally of grasses, with plant-wool interwoven, lined with fine plant-fibres; size: 65 diam. × 45 mm depth, and 65 × 35; cup inside: 45 diam. × 30—35 depth.

Distribution. South and West Celebes: — Macassar (Wallace *1*, Meyer *5*, Weber *10*, P. & F. Sarasin), Maros (Guillem. *9*), Bonthain Mts. (Everett *13*, Doherty *14*), Sosso, S. W. Central Celebes (P. & F. Sarasin *12*), West Celebes (Doherty *14*); Bonerate Id. (P. & F. S. *12*); Saleyer, Djampea and Kalao (Everett *13*); Lombok (Wallace etc. *1, 8, 11, 13*); Sumbawa (Doherty *13*); Ternate (Wallace *8*, Beccari *7*).

In Celebes this White-eye has as yet been recorded only from the South and West, and from the islands between the South and Flores, and its peculiar distribution is suggestive of its having recently spread its range by flight from Lombok or Ternate. On one side it is closely related to *Zosterops flava* (Horsf.) of Sumatra, Java and Borneo, a species distinguishable according to Salvadori *(6)* by its larger size, its having more yellow on the forehead, less on the upper tail-coverts, the rump not brighter than the back, the black subocular streak not extending so far forward, the bill small and delicate; in the Moluccas, *Z. buruensis* Salvad. of Buru seems from the description to be very like the young *Z. intermedia*, differing from the adult by its duller and duskier upper- and paler under-surface; while *Z. intermedia* is said to differ from *Z. chloris* Bp. of Banda, another very near ally, by being "of a greener shade, with the underparts purer and more sulphur-yellow" (Sharpe *8*). *Zosterops brunneicauda* Salvad. of Ceram Laut, Choor, and Aru is held by Hartert to differ by its quite black bill and more olive flanks.

* 194. ZOSTEROPS ATRIFRONS Wall.

Celebes Black-fronted White-eye.

Zosterops atrifrons *(1)* Wall., P. Z. S. 1863, 493; *(2)* Finsch, Neu Guinea 1865, 164; *(3)* Gray, HL. I, 1869, 162, Nr. 2121; *(IV)* Wald., Tr. Z. S. 1872, VIII, 72, pl. IX, fig. 3; *(5)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 662; *(6)* Brüggem. Abh. Ver. Bremen V, 1876, 74; *(7)* Lenz, J. f. O. 1877, 375; *(8)* Salvad., Orn. Pap. II, 1881, 369; *(9)* W. Blas., J. f. O. 1883, 125, 138; *(10)* Sharpe, Cat. B. IX (gen. *Zosterops*) 1884, 176; *(11)* W. Blas., Ztschr. ges. Orn. 1886, 197; *(12)* Platen, Gefied. Welt 1887, 206; *(13)* W. Blas., Ornis 1888, 594; *(14)* Tristr., Cat. Coll. B. 1889, 210; *(XV)* Meyer, Abb. v. Vogelskel. II, 1892, 48, pl. CLXXIII; *(16)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 12; *(17)* iid. ib. 1896, Nr. 1, p. 12; *(18)* Hart., Nov. Zool. 1897, 161.

a. **Zosterops nigrifrons** *(1)* Hartl., J. f. O. 1865, 22 (ex Temm. MS. in Mus. Leyden).

Figures and descriptions. Walden *IV*; Meyer *XV* (skeleton); Wallace *1*; Hartlaub *a 1*; Sharpe *10*.

Adult. Above with sides of head and neck olive-green, yellower on the rump and upper tail-coverts; quills black, except on the outer primary and the distal ends of the others; tail black; forehead and region in front of eyes black; orbital ring white; chin and throat greenish ochre-yellow; under tail-coverts ochre-yellow; breast and sides ashy; abdomen and under wing-coverts white; inner edges of quills below pale (♂, Rurukan, 19. VIII. 84: Platen in Mus. Nehrkorn, Nr. 960). Iris light brown (olive-brown — Wallace *1*); bill black; feet lead-grey (Platen).

Female. Answers to the above description, but the feet are "hellgrau" and the chest olive-grey (♀, Mus. Berlepsch).

Measurements (after W. Blasius *13* — from numerous examples of both sexes, and 4 ♂♂ and 2 ♀♀ in the Sarasin Coll.). Wing 51—54.5 mm; tail 35—38.5; culmen c. 11; bill from nostril c. 7—8; tarsus c. 15.

Skeleton.

Length of cranium	26.0 mm	Length of fibula	6.0 mm
Greatest breadth of cranium	12.0 »	Length of tarso-metatarsus	14.0 »
Length of humerus	13.0 »	Length of digitus	12.0 »
Length of ulna	14.5 »	Length of sternum	13.7 »
Length of radius	14.0 »	Greatest breadth of sternum	9.0 »
Length of manus	13.5 »	Height of crista sterni	4.0 »
Length of metacarpus	7.5 »	Length of coracoideum	13.0 »
Length of digitus principalis	6.0 »	Length of scapula	14.0 »
Length of femur	13.5 »	Length of clavicula	12.8 »
Length of tibia	21.4 »	Length of pelvis	16.0 »

Egg. "The egg sent home by Dr. Platen from Rurukan in the Minahassa is like the eggs of all *Zosteropidae* uniform blue and measures 15 × 12.5 mm" (Nehrkorn MS.). Two eggs obtained by Drs. Sarasin at Tomohon, 16. April, 1894, are rounded ovate in shape and bluish white in colour, having no doubt become bleached after blowing.

Nest. The Sarasins also obtained two nests of this little bird, one with 3 young ones (Tomohon, 2. May, 1894), the other with the above two eggs. The first is suspended by means of cobweb between the fork of a twig. Both are neat cup-shaped structures, the outer wall formed of moss, then some shreds of dead weed-growths, or such like, well lined with long, black, hair-like, vegetable fibres. Diam. internal c. 5 cm, external c. 7 cm, depth c. 3.5 cm.

Distribution. North Celebes: Minahassa (Wallace *1*, *10*, Platen *12*, *13*, etc.); Buol (P. & F. Sarasin *16*); Gorontalo (Leyden Mus. *a* 1); Tawaya, W. Celebes (Doherty *18*); Lake Posso, Central Celebes (P. & F. S. *17*).

In the IX. volume of the British Museum Catalogue of Birds (1884) Dr. Sharpe described 85 species of the genus *Zosterops*, and we have had no difficulty in finding notice of upwards of 40 new species described in the following ten years, so that this genus now embraces upwards of 125 forms. *Zosterops atrifrons* belongs to Dr. Sharpe's division "B", in which either the throat or the under tail-coverts are yellow, differing from the breast, and it is one of the following group with black foreheads:

1. *Z. atricapilla* Salvad.: Sumatra;
2. *Z. clara* Sharpe: Kini Balu, Borneo;
3. *Z. nehrkorni* W. Blas.: Great Sangi;

4. *Z. atrifrons* Wall.: North Celebes;
5. *Z. subatrifrons* M. & Wg.: Peling;
6. *Z. delicatula* Sharpe: S. E. Guinea and (*Z. frontalis* Salvad.) Aru;
7. *Z. chrysolaema* Salvad.: Arfak Mts., N. W. New Guinea.

Z. clara is distinguishable from *atrifrons* by its having the middle of the breast and abdomen yellow, the other species by their somewhat larger size; *Z. atricapilla* further by its having the whole crown of head black, *Z. delicatula* by its having the sinciput as well as the forehead black and the throat bright yellow, not greenish ochre-yellow, the under tail-coverts brighter yellow, the sides of the breast less tinted with grey (Salvad., Sharpe), *Z. chrysolaema* by its dusky brown forehead and deep golden yellow throat (Sharpe). The differences between *atrifrons* and *nehrkorni* are very accurately pointed out by W. Blasius *(13)*: *Z. nehrkorni* is larger, and on the upper surface, especially on the rump and upper tail-coverts, lighter and brighter green-yellowish, it has a bright golden yellow colour on chin, throat and under tail-coverts; bill and feet paler.

The peculiar, disjointed character of the geographical distribution of *Zosterops atrifrons* and its allies can only be understood on the explanation that the birds spread their range by flight, though we may expect to find yet other members of this group in the Moluccas. In the light of what Sir Walter Buller writes (B. New Zeal. 2nd ed. 1888, I, p. XLI, 78—81) on *Z. caerulescens* (Lath.) of Australia, New Zealand, and the Chatham Islands, the distribution by flight is no great assumption. *Z. caerulescens* in New Zealand was only known from the South Island, and "crossed Cook's Strait, for the first time within the memory of man, in the winter of 1856, coming over in numerous flocks, as if to explore the country; then retired for two years, and reappeared in greater numbers than before in the winter 1858, since which time it has been a permanent resident in the North Island, breeding in every district and becoming more plentiful every year". Very suggestive also is the following note by Mr. G. B. Owen recorded by Sir W. Buller (p. 79): "On my passage from Tahiti to Auckland, per brig Rita, about 300 miles north of the North Cape of New Zealand, I saw one morning several little birds flying about the ship. From their twittering and manner of flying I concluded that they were land-birds, and they were easily caught. They were of a brownish grey and yellowish colour, with a little white mark round the eye. I saw several pass over the ship during the day, travelling northwards. I arrived in Auckland a few days afterwards, on the 20th of May, when the so-called Blightbirds *(Zosterops caerulescens)* appeared here in such numbers, and I at once recognised them as the same". Such facts as these make it pretty clear how *Zosterops* may have reached the volcanic, almost mammalless islands of Polynesia, where these small birds are now known as far east as Ponape and Fiji.

Z. atrifrons in North Celebes seems to be sociable in its habits. Dr. Platen *(12)* speaks of a swarm of something like a hundred in the coffee-plantations

at Rurukan, where they were eagerly searching among the twigs for aphides and the like. The *Zosteropes*, according to Dr. Hartlaub *(a 1)*, usually go in small flocks, more rarely alone or in pairs, and feed upon small insects and fruit. Some are known to have a pleasant song.

Z. atrifrons is not yet known in South Celebes.

* 195. ZOSTEROPS SUBATRIFRONS M. & Wg.

Peling Black-capped White-eye.

Plate XXX.

Zosterops subatrifrons *(1)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 2, p. 17.

"Silel", Peling, native name.

Adult. Like *Z. atrifrons*, but the black of the forehead passing over the crown, the sides of the head brownish olive (not greenish yellow-olive), the yellow of the throat clearer (not olive-yellow), the breast whiter (not so strongly washed with grey), the upper parts very slightly duller — less of yellow in the olivaceous tint (ad. Peling, V.—VIII. 95 — C 14535).

Measurements. Wing 53—55 mm; tail c. 41; bill from nostril 8; tarsus 16.

Distribution. Peling Island (in Dresden and Tring Mus.).

Among the skins sent by our native hunters from Peling was a series of eight of this local species. It is most like *Z. atrifrons* of the mainland of Celebes, while *Z. delicatula* of New Guinea also stands near, but is larger and has the cheeks and throat pure yellow.

* 196. ZOSTEROPS NEHRKORNI W. Blas.

Sangi Black-fronted White-eye

Plate XXXI.

Zosterops nehrkorni *(1)* W. Blas., "Braunschweig. Anzeigen" (newsp.!) 11. Jan. 1888, Nr. 9, p. 86; *(2)* id., Russ' Isis 1888, 78; *(III)* id., Ornis 1888, 593, t. 4, f. 2.

Figure and description. W. Blasius *III.*

Adult male. Forehead and region in front of the eyes black; entire upper surface, with sides of head and neck, yellow olive-green, somewhat paler on the rump and upper tail-coverts; quills black, externally margined with the colour of the back, except on the outer primary and the free ends of the others; tail black; orbital ring white; chin and throat light ochre-yellow; under tail-coverts somewhat darker ochre-yellow; breast and sides ashy grey, darkest on the breast; abdomen and under wing-coverts white; metacarpal edge ochre-yellow; thighs pale yellow (type, ♂, Great Sangi, 21. XII. 86: Platen in Mus. Nehrkorn, Nr. 2051).

Iris red-brown; bill above dark brown; under bill and feet light brown (Platen).

Measurements. Wing 59 mm; tail 42.5; bill from feathers of forehead 12; tarsus 16 (W. Blas. *III*).

Distribution. Great Sangi (Platen *III*).

Only a single specimen of this species is known, the type which Mr. Nehrkorn has had the great kindness to lend us. It has close affinities with *Z. atrifrons* of North Celebes, which differs by its smaller size, by its having the black of the forehead carried a little further towards the crown, the upper surface somewhat darker, especially on the rump and upper tail-coverts, the chin and throat greenish ochre-yellow and notably darker, the breast paler ashy, the bill black instead of brown, the feet lead-grey instead of pale brown. *Zosterops nehrkorni*, in the opinion of Prof. W. Blasius, is most like *Z. chrysolaema* Salvad. of the Arfak Mountains of North-west New Guinea, from which it differs in having the breast and sides of the abdomen ashy, the thighs pale yellow, the forehead and anteocular region dusky black, the subocular region green yellowish, and by the colour of the bill and feet.

* 197. ZOSTEROPS SARASINORUM M. & Wg.

Celebes Mountain White-eye.

Plate XXXI.

Zosterops sarasinorum *(1)* M. & Wg., J. f. O. 1894, 114; *(2)* iid., Abh. Mus. Dresd. 1895, Nr. 8, p. 12; *(3)* iid., ib. 1896, Nr. 1, p. 6; *(4)* Hart., Nov. Zool. 1896, 153; *(5)* id., ib. 1897, 157.

Diagnosis. Like *Z. palpebrosa* (Temm.) of India, but the sides very pale yellowish drab, not grey (see Hartert *5*), throat and jugulum canary-yellow, passing into lemon-yellow on the sides of throat and jugulum, chin and anterior malar region, this colour being clearly separated from (not blending with) the yellow olive-green of the hind cheeks, ear-coverts and sides of neck; upper surface somewhat yellower olive-green.

Adult male. Above yellow olive-green, most olivaceous on the wing-coverts and mantle, yellowest on the rump and upper tail-coverts; supra-loral region and forehead at base of bill lemon-yellow, passing on the forehead into the yellow olive-green of the crown; orbital ring white; a narrow loral streak continued as a line under the orbital ring black; hind cheeks, ear-coverts and sides of neck concolorous with the upper surface; chin, anterior malar region, sides of throat and of jugulum lemon-yellow, lighter on the middle of throat and jugulum; under tail-coverts less pure yellow; remaining under-parts white, washed with buffy drab, chiefly on the sides and flanks; under wing-coverts and inner edges of quills below whitish, the former washed with yellow especially on the metacarpal edge (type, ♂, Mount Klabat, circa 6000 ft., N. Celebes, end of September, 1893: Sarasin Collection).

"Iris sepia; bill above black, base of under mandible bluish; feet and legs slate-colour" (Sarasins).

Immature male. The yellow on the supra-loral region and forehead much less developed; the yellow of the gular region much paler and less pure; the upper surface less yellow in tint (♂, Mt. Klabat, c. 6000 ft.: 24.—26. Sept. 1893: Sarasin Collection).

The original colours of four other specimens from the same point have been destroyed by preservation in alcohol[1]).

[1]) Alcohol works disastrously upon the yellow olive-green tints of *Zosterops*, converting them into greyish olive, so that specimens so preserved have been mistaken by competent ornithologists for new species.

Measurements. Wing 53—55 mm; tail 37; bill from feathers of forehead 9—9.5, from anterior edge of nostril 6.5—7; tarsus 16.

Distribution. N. Celebes: Summit-region of Mount Klabat, c. 6000 feet, Soputan Ridge, and crater of Mt. Masarang, Rurukan (P. & F. Sarasin); S. Celebes: Mt. Bonthain, 5000—6000 ft. (Everett *4*, Doherty *5*).

This White-eye was discovered by the cousins Sarasin on the top of the volcano Klabat, the highest mountain (6377 feet ap. de Hollander) of the Minahassa. "We dwelt", says Dr. F. Sarasin (in lit.), "for four days in a hut on the highest point, or, rather, about 30 metres below it, in order at once to obtain in some measure an insight into the fauna and flora, as also into the meteorological conditions. The avifauna up there is scanty, just this *Zosterops* only peopled the summit-region in numerous flocks; on all sides its bright chirping sounded in the mossy bush-growths". The birds had been feeding — as shown by the contents of the stomachs of four specimens sent in spirit — on large and small seeds, the former apparently those of berries which had been swallowed. There was no trace of insects or animal-food of any kind. This time of the year — the end of September — seems to be the breeding season, the testes of the males being large, though the ovaries of the females were small, as if the eggs would not be laid for some time or had already been laid. It was soon afterwards found by the Sarasins at other high elevations in the Minahassa, and by Everett and Doherty on the Peak of Bonthain in the south.

Zosterops sarasinorum is one of an extremely closely interconnected group with the under surface of two colours (Sharpe, Cat. B. IX, 148 — section "B"), yellow supraloral and frontal region, but no narrow yellow stripe along the middle of the abdomen. The discrimination of the members of this group is impossible to perform satisfactorily by means of descriptions alone[1]). The species are:

Z. palpebrosa (Temm.): India, Ceylon, Nicobars, Andamans, Laccadives;
Z. simplex Swinh.: China;
Z. neglecta Seeb. (Ibis 1893, 219, 258): East Java;
Z. citrinella Bp.: Timor;
Z. sarasinorum M. & Wg.: Celebes;
Z. anomala M. & Wg.: South Celebes;
Z. abyssinica Guérin: Abyssinia, Socotra;
Z. poliogaster Heugl.: N.E. and S.E. Africa;
Z. anjuanensis E. Newt.: Comoro group;
Z. demeryi Büttik. (Notes Leyd. Mus. 1890, 202): Liberia;

[1]) The matter would be rendered easier if ornithologists could be induced to adopt some fixed nomenclature of colours. Dr. Sharpe speaks of the upper surface of *Z. palpebrosa* as "olive-yellow", Mr. Oates (Faun. B. Ind. I, 213, 214) as "golden-yellow"; Dr. Sharpe speaks of its throat as "golden-yellow", Col. Legge as "primrose-yellow" — ergo, primrose-yellow should be the same thing as olive-yellow and the bird's back and throat of the same tint! We recommend Radde's International Colour-scale, instead of Ridgway's or Saccardo's, the latter being quite insufficient.

These species are grouped together on the lines of Dr. Sharpe's careful key to the genus, in virtue of their having yellow on the forehead and no yellow stripe on the abdomen, but some species possessing both these characters are undoubtedly as nearly related to some of the above species, as they are to one another.

Z. citrinella, which we have not been able to examine, is said by Mr. Hartert *(5)* to be the nearest ally of *Z. sarasinorum*: "They are very similar to each other, in fact so much that they might be merely subspecies. *Z. citrinella*, however, is a little larger, with longer wings and beak, and has the sides of the breast and abdomen more strongly washed with greyish brown, and the middle of the breast and abdomen is lighter and more washed with pale yellow in *Zosterops sarasinorum*".

The distinguishing characters of *Z. palpebrosa* have been pointed out, *antea*. *Z. neglecta*, which from its geographical location might have been expected to show close correspondence with *sarasinorum* is said by Seebohm to be greener than the Indian bird, whereas *Z. sarasinorum* appears yellower when compared with two specimens (though apparently not in fully adult male dress) of *Zosterops palpebrosa* in the Dresden Museum. Still a comparison of *Z. neglecta* with *sarasinorum* would by very desirable, since *neglecta* is also a mountain species, having come from an altitude of 5000 feet in East Java (Seebohm l. c.).

Z. anjuanensis has the under surface more drab-tinted and the yellow of the throat of a slightly duller tint (C 10229); *Z. demeryi* has the under surface ashy grey strongly tinged with yellow (Büttik.). The differences between *Zosterops sarasinorum* and *simplex*, *poliogaster* and *abyssinica* seem from the descriptions to be greater.

The two other Celebesian *Zosterops*, *Z. atrifrons* and *intermedia*, are readily distinguishable from *sarasinorum*, the first by its black forehead, the second by its entirely yellow under surface; *Z. anomala* by its black and bare orbital ring.

Zosterops is a genus consisting of a few well-marked types, which appear to have been scattered and re-scattered by flight; and now, wherever one of these types is found in a new locality, it is named as a new species. A new monograph of the genus is already much needed. Dr. Hartlaub's "Versuch" is now 30 years old, Dr. Sharpe furnishes a sequence of descriptions of 85 species with a key, and, as already mentioned, this number has now been raised to over 125. Yet it is impossible to discriminate these "species" by means of descriptions alone; moreover next to nothing is known about the modifications of their different colours with age, and these appear to be much greater than many of the "species"-modifications, nor has any one, so far as we are aware, pointed out between what limits of coloration and structure adult individuals from the same locality are apt to vary — limits that may prove wide enough in very many cases to overlap the variation-limits of the nearest ally in another quarter, reducing *Zosterops* perhaps to some 12—20 clearly defined species, some of them composed of a large series of ill-defined races.

When this is done, but not before, it will be possible to obtain a ready and sound grasp of the sort of facts which the 125 "species" of the genus *Zosterops* really place before us. At present they are 125 disconnected items, with which no one with a smaller amount of material before him than that in the British Museum can safely meddle.

*198. ZOSTEROPS ANOMALA M. & Wg.

Anomalous White-eye.

Plate XXX.

Zosterops anomala *(1)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 12; *(2)* Hart., Nov. Zool. 1896, 149, 153; *(3)* id., ib. 1897, 157.

Diagnosis. Like *Z. sarasinorum*, but without the white periocular ring; a space of bare dark skin round the eye, enclosed by an incomplete ring (not meeting posteriorly) of black feathers, the body below greyish white, not washed with yellow.

Adult. Above yellowish olive-green, brighter on the rump and head; base of forehead and supraloral region yellowish; feather-ring round the naked periocular ring black, the white ring characteristic of the genus wanting, indicated only by a few minute white points; chin, throat, and under tail-coverts lemon-yellow with a slight tinge of ochre most pronounced on the under tail-coverts; remaining under parts silky white, with a shade of smoke-grey most pronounced on the breast and sides; thighs whitish; flanks greenish, passing into the yellow of the under tail-coverts; metacarpal edge yellow; under wing-coverts whitish: "iris pale brown; feet pale bluish grey; beak black, base of mandible pale" — Doherty (♂, type, Macassar, 21. VII. 95: Sarasin Coll.).

Female. Does not differ from the male in coloration (♀, Loka, S. Cel., 9. X. 95, P. & F. S.).

Measurements. Wing 56—57 mm; tail 45—47; tarsus 16.5; exposed culmen 11.5—12, from nostril 8.

Distribution. South and S. W. Central Celebes: Macassar (P. & F. Sarasin *1*), Mt. Bonthain neighbourhood up to 4000 ft. (P. & F. S., Everett *2*, Doherty *3*), Marangka, Maros Peak (P. & F. S. *1*), Enrekang and Mount Loko near Bungi, S. W. Central Celebes (P. & F. S. *1*). An example, believed by the Drs. Sarasin to belong to this species, was obtained by them at Kendari in S. E. Celebes, but unfortunately was lost.

This little bird is a true White-eye in every respect except that it wants the very character from which its fellows take their name — the ring of small white feathers round the eye. It belongs to the same group as *Z. sarasinorum*, of which the Indian *Z. palpebrosa* may be regarded as the type, in which the chin and throat are yellow and the body below greyish or whitish. A ring of minute whitish points (obviously undeveloped feathers) is to be made out in most specimens of *Z. anomala* in the ring of featherless blackish skin round the eye. It is hardly to be doubted that they are the vestiges of the usual white eye-ring of the *Zosteropidae*.

* 199. ZOSTEROPS BABELO M. & Wg.

Talaut White-eye.

Plate XXX.

Zosterops babelo *(1)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 9, p. 6.
"Babelo" or **"Bambelo"**, native name, Karkellang, Nat. Coll.

Adult. Above yellowish olive-green, brighter on the upper tail-coverts and forehead; wings and tail dusky, externally edged with the colour of the upper parts, lighter on primaries; chin and throat ochraceous yellow, a small supraloral mark nearly as bright; a broad stripe along the middle of the body, crissum, thighs, under tail-coverts and metacarpal edge sulphur-yellow, hardly tinged with ochre; sides of breast and of body light smoke-grey; periocular ring white, a slight mark below it and on the lores blackish; under wing-coverts white washed with yellow; legs and feet (in a fresh skin) flesh-colour; bill blackish, pale at base of lower mandible (Karkellang, autumn, 1896 — C 15384; Nov. 1894, type — C 13850).

Measurements (2 examples). Wing 60, 61 mm; tail 43, 44; tarsus 17; exposed culmen 11, 12, from nostril c. 8.

Distribution. Talaut Islands — Karkellang (Nat. Coll.).

Three specimens of this White-eye — two in the Dresden and one in the Tring Museums — are the only ones known at present. It is a rather large form of its kind, and has its nearest affinities in the following group with a broad yellow stripe along the body below and the head and back concolorous:

Z. basilanica Steere: Basilan, Samar, Leyte, Dinagat, Mindanao, Bongao;
Z. everetti Tweedd.: Cebu;
Z. grayi Wall.: Kei Islands;
Z. aureiventris Hume: Tenasserim to Java;
Z. mesoxantha Salvad.: Burmah:
Z. salvadorii M. & Wg.: Engano;
Z. albiventris Rchb.: Cape Grenville and the islands of Torres Straits;
Z. crissalis Sharpe: New Guinea;
Z. siquijorensis Bourns & Worces.: Siquijor, Negros.

Of these the Talaut bird seems to be most like its nearest neighbour, *Zosterops basilanica*, which was rather insufficiently described by Prof. Steere, but the throat, being described as sulphur-yellow (as the abdomen), and the upper surface dark olive-green should serve to distinguish it from the Talaut form, in which the throat is ochraceous yellow, darker than the sulphur-yellow of the abdomen, etc. and the upper surface yellowish olive-green.

FAMILY TIMELIIDAE.

The *Timeliidae*, or Babblers, might almost be said to consist of any exotic birds, standing near, but which cannot exactly be referred to the Warblers,

Thrushes, or Shrikes, most of them possessing a short, blunt wing rounded to fit the body (see, also, Newton, Dict. B. pp. 25, 962). A careful revision of the Indian species is given by Oates (Faun. Br. Ind. B. I, 1889, 70, 71), who admits 6 subfamilies. Only 5 genera are known from Celebes, and they seem to belong to Oates's *Brachypodinae*, *Crateropodinae* and *Timeliinae*.

The *Brachypodinae* (to which *Iole* belongs) are described *(l. c.)* as follows: "Sexes alike; solitary or occurring in small troops; habits entirely arboreal; tarsi very short, never exceeding in length the middle toe and claw (*Criniger* forms exceptions); wing rounded and moderately long; nape usually furnished with some hairs; colour of egg, so far as is known, spotted".

Timeliinae: "Sexes alike; solitary or occuring in very small troops; not noisy; legs and feet strong; wing short and rounded; habits, skulking in bushes or on the ground, evading observation (except *Androphilus*); colour of egg, with few exceptions, spotted". *Trichostoma* and *Malacopteron* belong here.

Malia and *Androphilus* probably belong to Oates's *Crateropodinae*: "Sexes alike; gregarious; extremely noisy; wing short and rounded; habits partly terrestrial, partly arboreal; colour of egg, with few exceptions, unspotted white or blue".

GENUS IOLE Blyth.

The species of the Celebesian area and of the Moluccas have commonly been referred to the genus *Criniger*, which differs in having some long nuchal hairs, a broader bill with a more rounded culmen and a more rounded nostril. On the other hand they seem to be connected with the genus *Iole* through *I. everetti* Tweedd. of the Philippines.

Bill as long as the cranium, or longer; tomia irregularly serrated or jagged; a small denticulation; culmen somewhat sharp; nostril membranous, long, narrow, semilunar; about 4 or 5 stout rictal bristles and some smaller ones; wing moderately long, 4th—6th quills the longest, 2nd about equal in length to the secondaries, 1st about half the size of 2nd; tail of 12 feathers, rounded, not quite as long as the wing; tarsus small, equal in length to middle toe and claw. Birds about the size of a Thrush, with olive and yellow as the predominating colours.

Range: Southern India to the Moluccas.

* 200. IOLE AUREA (Tweedd.).

Togian Bulbul.

Plate XXXII.

a. **Criniger aureus** *(1)* Wald., Ann. & Mag. N. H. 1872, (4) IX, 400; *(2)* id., Tr. Z. S. 1872, VIII, 110; *(3)* Meyer, J. f. Orn. 1873, 405; *(4)* id., Ibis 1879, 130, 146; *(5)* Wall., Island Life 1880, 436; *(6)* Sharpe, Cat. B. VI, 1881, 87; *(7)* W. Blas., J. f. O. 1883, 126; *(8)* id., Ornis 1888, 595; *(9)* Meyer, Ibis 1892, 179.

Descriptions. Walden *a 1*; Sharpe *a 6*.

Adult male. Above, including ear-coverts and cheeks rich olive-yellow, lighter on lower back, rump and upper tail-coverts, which are washed with orange; a slight tinge of orange on mantle and back; the median and greater wing-coverts narrowly edged externally with brighter yellow than the back; quills dark brown, externally bright olive-yellow tinged with orange; tail-feathers dark olive-yellow; the centre ones washed with orange, all the rectrices tipped with bright yellow, narrowly on the centre ones, this colour extending also along the inner web of the feathers for nearly the entire length, excepting on the centre ones; lores yellow; throat and under-surface rich golden yellow inclining to orange; under tail-coverts rich orange-yellow; fore neck and sides of breast washed with olive; under wing-coverts and axillaries golden yellow; quills below dusky brown, yellow along the edge of the inner web (from Sharpe *6*).

Measurements. Wing 124 mm; tail 118; bill from nostril 16; tarsus 19 (Walden *a 1*).

Distribution. Togian (Meyer *a 1*, *a 4*, *a 9*).

This species is known by a single specimen which was found by Meyer in August 1871 on the highest point of the chief island of the Togian Group in the Gulf of Tomini. Its nearest affinities are with *I. longirostris* Wall. of Sula and *I. platenae* W. Blas. of Great Sangi, while *I. affinis* Hombr. & Jacq. from Ceram and Amboina differs chiefly in having the tail more broadly tipped with yellow than in the three forms of the Celebesian area. *I. aurea* differs from *I. longirostris*, according to Walden, by being somewhat smaller, by having a much shorter bill, and by the bright golden colouring of its plumage. The orange tint of its under surface likewise serves to distinguish it from *I. platenae*, which is bright yellow below.

The presence of *Iole*, or as it has there been termed *Criniger*, in the island-groups round Celebes and its apparent absence on the mainland has been commented upon with some surprise by Mr. Wallace (Geogr. Distr. 1876, I, 431) and Prof. W. Blasius (Ornis 1888, 596), yet we have very little doubt but that it will ultimately be found in Celebes. The small Province of the Minahassa and the neighbourhood of Gorontalo and of Macassar alone have as yet been investigated with some care, but even here a number of new birds have been discovered in the last few years, and a much larger number doubtless remains to be found in the centre of the island, in the East and South-east Peninsulas, as also on the west coast and in the high mountain regions, judging from the results obtained there by the most recent collectors.

* 201. IOLE LONGIROSTRIS (Wall.).

Sula Bulbul.

a. **Criniger longirostris** *(1)* Wall., P. Z. S. 1862, 339; *(2)* Finsch, J. f. O. 1867, 6; *(3)* Gray, HL. 1869, I, 274, Nr. 4019; *(4)* Wald., Ann. and Mag. N. H. 1872, (4) IX, 400; *(4bis)* Salvad., Orn. Pap. II, 1881, 375; *(5)* Sharpe, Cat. B. VI, 1881, 87; *(6)* W. Blas., Ornis 1888, 596; *(7)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 2. p. 17.

b. **Trichophorus longirostris** *(1)* Finsch, Neu-Guinea 1865, 168.

"Pakak", Peling and Banggai, Nat. Coll.

Descriptions. Wallace *a 1*, Sharpe *a 5*.

Diagnosis. Similar to *I. aurea*, but the bill longer; under surface bright yellow without an orange tint; "throat olive-yellow, duller on the fore neck and breast, all of these parts indistinctly streaked with yellow shaft-lines" (Sharpe *a 5*).

Adult. Above yellow-olive-green, a little brighter on rump and tail-coverts; remiges and tail externally as the upper surface, tip of tail and inner edges also of the lateral feathers light yellow, shafts black, except near the tip; under surface olivaceous yellow, passing into the colour of the upper surface, clearing on the middle parts of the body below and under tail-coverts into pure lemon-yellow, lighter on the under wing-coverts, the olivaceous wash passing over the breast and sides, and more lightly over the chin and throat, shaft-streaks yellower; remiges below dusky, light yellow on the inner lining where it rests upon the body, rectrices below yellowish brown, light yellow on tips, inner borders and on shafts; bill dark horn; legs and feet pale brown (in skin), (ad. Peling Id., V.—VIII. 95 — C 14570).

Sexes. No sexual differences of coloration are known to exist.

Measurements (8 ex. Peling and Banggai). Wing 120—128 mm; tail c. 120; tarsus c. 20; bill from nostril 15—19; from suture 25.5—31.

Distribution. Sula Islands (Allen *a 1*), Peling and Banggai (Nat. Coll.).

This Bulbul was one of the new forms obtained by Mr. Wallace's assistant in the Sula Islands. It was subsequently found by our native hunters in Peling and Banggai. It is a yellower species than *I. aureus*, with a longer bill.

* 202. IOLE PLATENAE (W. Blas.).

Sangi Bulbul.

Plate XXXII.

a. **Criniger platenae** *(1)* W. Blas., "Braunschweig. Anzeigen" (newspaper!), 11. Jan. 1888, Nr. 9, p. 86; *(2)* id., Russ' Isis 1888, 78; *(III)* id., Ornis 1888, 595, pl. IV, fig. 2.

Figure and description. W. Blasius *a III.*

Adult male. Above almost uniform olivaceous yellow-green, the shafts of the feathers of the head and back, the outer edges of the primaries and the tips of the wing- and tail-coverts somewhat lighter; ear-coverts and malar region varied with yellow; below light yellow, on the sides of breast and of abdomen washed with green; under wing-coverts yellow like the under surface; the two middle tail-feathers narrowly tipped with yellow, the entire inner web and a broad tip of the other tail-feathers, and the inner edging of the quills where they rest upon the body sulphur-yellow (type, ♂, Great Sangi, 18. I. 87: Platen in Mus. Nehrkorn, Nr. 2048).

Iris red-brown; bill and feet blue-grey (Platen).

Measurements. Wing 126 mm; tail 117; tarsus 21; bill from nostril 17.

Distribution. Great Sangi (Platen).

We are indebted to Mr. Nehrkorn for the loan of the type of this species. It was one of the discoveries made by Dr. & Mrs. Platen during their stay in Great Sangi in 1886/87. Only two specimens, both males, were obtained. Their specific validity is clearly established by Prof. W. Blasius. The yellow loral region is the best characteristic of *I. platenae*.

GENUS MALIA Schl.

A genus peculiar to the mountains of Celebes, a large form, equal to a large Thrush in size, with olive and yellow for its chief colours. It has the habit of clinging to tree-stems like a Woodpecker and feeds on insects (P. & F. Sarasin).

Its most peculiar characters are its graduated, slightly decurved tail of 12 feathers, about equal to the wing in length, the outermost feathers about 3 cm shorter; its large legs and feet, the tarsus exceeding the middle toe and claw in length; the almost complete absence of rictal bristles. These characters serve to remove it far from *Criniger* and *Iole*. The bill and nostril are much like those of *Iole*, but the tomia are not roughly serrated and the tip is less bent down and has a slighter denticulation. The wing is very blunt, the tip, with the 4th—7th quills the longest, exceeding the secondaries and 3rd primary by about 1 cm only; 1st primary more than half the wing-length. The remiges are much curved, so as to fit the body.

* 203. MALIA GRATA Schl.

Mountain Bulbul.

Plate XXXIII.

The birds of the mountains of North Celebes, of which the two in the Sarasin Collection are before us, differ from those of the Bonthain Mountains, judging from four examples, in that, when adult, they develop pure lemon-yellow on the abdomen, whereas it is ochraceous yellow (being more affected by the olive of the sides) in the southern form. All the other supposed grounds, whereon we founded a species for the northern bird, *M. recondita*, have been thoroughly exploded by Mr. Hartert, who has thereby spared us trouble by doing well what we intended to do ourselves. The northern bird may for the present be admitted as a subspecies, *M. grata recondita*, and in this article the southern birds are termed *the typical M. grata*, though it unfortunately is not known whether the type came from S. Celebes or from Saleyer.

1. The typical Malia grata.

a. **Malia grata** *(1)* Schl., Notes Leyd. Mus. 1880, II, 165; *(2)* W. Blas., J. f. O. 1883, 127; *(3)* Sharpe, Cat. B. VII, 1883, 587; *(4)* id., Notes Leyden Mus. 1884, VI, 175; *(5)* Hart., Nov. Zool. 1896, 255; *(6)* id., ib. 1897, 159.

Diagnosis. The yellow on the mesial parts of the body below ochraceous yellow, clearing into pure lemon-yellow only on the throat.

Male. Above olive-green, darker and browner on the tail and wings, brighter and yellower on the mantle and head; below yellower, clearing into pure lemon-yellow on the throat, yellow slightly stained with olivaceous on the breast and abdomen, passing into yellow olive-green on the sides, browner olive-green on the flanks, thighs, crissum

and under tail-coverts; supraloral region yellowish, the ear-coverts with yellow shafts; remiges and tail below olive-brown; under wing-coverts and edge of wing yellower: "iris grey (two shades of brown, separated by a black line — Doherty *a 6*); bill yellow, above black; legs brown-yellow, soles yellow" (♂, Northern foot-hills of the Peak of Bonthain, c. 1050 m, 30. X. 95: Sarasin Coll.).

Female. Like the male.

Young. The yellow of the under parts duller and more ochraceous, the head and mantle olive-brownish without any yellow wash (♀ juv., N. foot-hills of Mt. Bonthain, 31. X. 95: P. & F. S.).

Measurements.	Wing	Tail	Tarsus	Bill from nostril
a. (Sarasin Coll.) ♂, Bonthain Mts. c. 1050 m, 30. X. 95	135	134	46	17
b. (Sarasin Coll.) ♀ ad., Bonthain Mts. 1550 m, 30. X. 95	132	127	45	17
c. (Sarasin Coll.) ♀ juv., Bonthain Mts. 1050 m, 31. X. 95	129	127	45	16.5
d. (C 14880) ♂, Bonth. Peak, 6000—9000 ft. Oct. 95 (Ev.)	136	130	47	17

Distribution. South Celebes — Bonthain Mts. (Everett *a 5*, P. & F. Sarasin, Doherty *a 6*); South Celebes or Saleyer Island (Teijsmann *a 1*).

The Drs. Sarasin supply the following notes on the habits of this bird: "Lives in small families; is not at all shy; has a lond piercing cry 'zike', and also a deep Blackbird-like cry; clings Woodpecker-like on tree-stems, as *Malia grata recondita*; feeds on small organisms in rotten wood".

In describing the type of this remarkable species Schlegel only says, that "a single skin of this bird was contained in a large collection of birds made, in 1877, during an expedition to Macassar and the neighbouring isle of Saleyer, under the leading of the well-known botanical traveller, Mr. Teijsmann". This is all that is known about the place where the type came from; whether it was killed in Saleyer or on the Southern Peninsula of Celebes may long remain in uncertainty.

2. Malia grata recondita M. & Wg.

b. **Malia recondita** *(1)* M. & Wg., Abh. u. Ber. Mus. Dresd. 1894/95, Nr. 4, p. 1; *(2)* iid., ib. Nr. 8, p. 12.

Diagnosis. The yellow on the abdomen pure lemon-yellow, a little paler than that of the throat.

"Iris light brown; bill black, under mandible yellow; feet and legs grey-yellow" (P. & F. Sarasin).

Measurements.	Wing	Tail	Tarsus	Bill from nostril
a. (Sarasin Coll.) ad., Hill-forest between the Minahassa and Mongondo, c. 1000 m, 30. XI. 93: type . . .	139	130	46	17
b. (Sarasin Coll.) ♀ ad., G. Mantinang, c. 1500 m, 28. VIII. 94	130	—	43	16.5

Distribution. North Celebes, the mountain-forests as above (P. & F. Sarasin).

The type specimen of this form of *Malia* was obtained by the cousins Sarasin in the Northern Peninsula of Celebes, during their difficult journey

of exploration through the almost impassible virgin-forest and gorges of the interior between Manado and Gorontalo.

The Drs. Sarasin made the following notes on this bird. In the stomach of the first specimen: "insects, beetles". "In certain high regions of the Mantinang chain (whence came the second example) *Malia* is one of the most plentiful birds. Its powerful cry resounds on all sides, bringing to mind certain notes of our Blackbird, and one often sees them clinging like Woodpeckers to stems".

The genus *Malia* is peculiar to Celebes, and its nearest allies are not readily to be found.

The next genus, *Androphilus*, has much in common with it — very similar wings, legs, rictus, and distribution of colours, but it has 10 rectrices only in its still more graduated tail. Dr. Sharpe speaks of *Malia* as nearly allied to *Mystacornis* and as thus shewing a link between the Avifaunae of Celebes and Madagascar, but, with all respect for the judgment of this eminent ornithologist, we must say *Mystacornis* differs greatly in coloration, in shape of bill, in tarsus, in form of tail, which is hardly graduated — indeed we do not know what can be said for the affinity of the two birds, except that they belong to the same family. *Malia* is a highly interesting Celebesian type, which must take equal rank with *Meropogon*, *Scissirostrum* etc.

GENUS ANDROPHILUS Sharpe.

These birds are of about the size of a Sparrow, and the olivaceous of the upper surface extends over the sides, flanks, thighs, and under tail-coverts below. They are best characterized by the strongly graduated tail of 10 feathers, and by the almost complete absence of rictal bristles, about three minute bristles being found, if looked for. Culmen shorter than the cranium, nearly straight, the tip overlapping, a small denticulation; nostril oval, the feathers of the forehead covering the nasal membrane, but not the nostril; wing short, blunt, and curved to fit the body, the quill-formula as in *Malia*; tarsus and toes large, the tarsus slightly longer than the middle toe and claw.

In wing, legs, the absence of rictal bristles, and the distribution of its colours this genus agrees with *Malia*; it differs by its graduated tail of 10 feathers and its straight bill with the decurved tip overlapping from the notch; the anterior toes are also relatively a little longer. It is also allied to Mr. Ogilvie Grant's *Pseudotharrhaleus*, which is like it in general appearance, but has twelve tail-feathers.

Androphilus is at present known from the highlands of Celebes and from Mt. Kini Balu, Borneo.

* 204. ANDROPHILUS CASTANEUS (Bütt.).

Mountain Babbler.

Plate XXXIV.

a. **Turdinus castaneus** *(1)* Büttik., Notes Leyden Mus. 1893, XV, 261; *(2)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 12.

b. **Drymocataphus castaneus** *(1)* Büttik., Notes Leyden Mus. 1895, XVII, 92.

c. **Androphilus everetti** *(1)* Hart., Nov. Zool. 1896, 69, 151; *(2)* id., ib. 1897, 155.

Descriptions. Büttikofer *a 1*; Hartert *c 1*.

Adult male. Above, including the remiges and rectrices externally, chestnut-olive, a little duller and of a slightly squamous appearance on head and neck; face and breast mouse-grey, whiter on the abdomen, the ear-coverts with whitish shafts; chin and throat whitish; supraloral and superciliary stripe whitish, posteriorly more mouse-grey; lores dusky; sides of body and thighs chestnut-olive as above, but lighter; under tail-coverts a little paler; tail below olive-brownish; remiges below dusky; under wing-coverts olive-brown: "Iris chocolate-brown; bill black, base of mandible pale brown; legs and claws olive-brown" — Everett *c 1* (♂, Tomohon, N. Cel., 28. IV. 94: Sarasin Coll.).

Remark. This specimen has been compared with the type of the species by Mr. Büttikofer, who writes that the latter fully agrees with it, except that it has more white on the under surface, but the grey colour is making its appearance on the white spaces, and it seems to be a younger bird.

Female. Like the male. "Unless some of the specimens are wrongly sexed, there is no constant difference in size between the sexes" (Hartert).

Measurements.	Wing	Tail	Tarsus	Bill from nostril
a. (C 13897) ♂, Tomohon, N. Cel., 28. IV. 94 (P. & F. S.)	62	56	27	9
b. (Sarasin Coll. in spirit) ad., Tomohon, 8. IV. 94 . .	58	—	25.5	9
c. (Sarasin Coll. in spirit) Tomohon, 8. IV. 94	60	55	25	8.5
d. (Sarasin Coll.) ♂ ad., Loka, S. Cel., 18. X. 95 . .	61	62	25	9
e. (C 14884) ♂ ad., Bonthain Peak, c. 6000 ft., Oct. 95 (Ev.)	61	—	26	9
f. (C 14885) ♀ ad., Bonthain Peak, c. 6000 ft., Oct. 95 (Ev.)	61	—	25	9

Distribution. North Celebes — Minahassa (v. Rosenberg *a 1*); Tomohon (P. & F. Sarasin *a 2*); South Celebes — Bonthain Mts. (Everett *c 1*, P. & F. Sarasin, Doherty *c 2*).

A single specimen of this species was obtained by v. Rosenberg in the Minahassa on 9th September 1874, and the Drs. P. & F. Sarasin found it again in April, 1894, near Tomohon at about 2500 feet. The genus seems to vary much in the size of individuals, the type described by Büttikofer being smaller in the wing (56 mm), tail (52), and tarsus (22). *Trichostoma celebensis* varies much in the same way. Mr. Hartert received among others from the Peak of Bonthain "a perfect giant, with a wing of 64 mm in length".

Mr. Hartert, not having for comparison specimens from the North, which were wrongly referred by Mr. Büttikofer and ourselves to the genera *Turdinus* and *Drymocataphus*, named the Southern birds as a new species, *Androphilus everetti*. After, for the second time, making the most careful comparison of the

Northern and Southern birds, we find ourselves unable to point to any tangible difference between them; there is some amount of individual variation, but it would be unsafe at present to say that there is any racial divergence.

Trichostoma and *Drymocataphus* (examined: *D. capistratus*) have 12 rectrices; *Androphilus*, as was first pointed out by Mr. Ogilvie Grant (Ibis 1895, 448), has only 10; it has also only about three very short and inconspicuous rictal (or, better, subloral) bristles. Mr. Ernst Hartert rightly refers his Celebesian birds to this genus, which is a very aberrant one, known as yet only in *A. accentor* Sharpe from Mt. Kini Balu, Borneo, and in the present *A. castaneus* Büttik. from the highlands of Celebes. The throat of the former is spotted with black. Probably some further allies of these birds will be found among some of the known species of *Drymocataphus* and others when the rectrices have been examined.

GENUS CATAPONERA Hart.

A genus peculiar to Celebes, in size and appearance very Thrush-like, differing chiefly by the short, rounded wing and the black parietal stripe. The 1st primary is about half the length of the 2nd, which is about as long as the secondaries, the 4th, 5th and 6th primaries forming the tip of the wing. Tail of 12 feathers, nearly as long as the wing, and nearly square in shape. Bill Thrush-like, nostril oval, the frontal plumes impinging to its base; rictal bristles of moderate size; behind the eye a small bare patch. Tarsus rather long, 1/3 the wing-length, not scutellated, except near the foot; toes long, but shorter than the tarsus, the middle toe exceeding the lateral ones by more than the length of its claw.

The following is the only known species, and it seems to stand between the Thrushes and the *Crateropodinae*.

* 205. CATAPONERA TURDOIDES Hart.

Black-browed Babbler.

Plate XXIX.

Cataponera turdoides *(1)* Hartert, Nov. Zool. 1896, III, 70, 151.

Adult male. Above olive-brown, slightly paler on the head, duller on wings and tail (the latter crossed with obscure, narrow bars seen only in certain lights); under parts greyer (or more olive-drab), inclining to whitish fawn-colour on abdomen and flanks, russet on thighs and under tail-coverts, browner on under wing-coverts; apex of chin whitish; a broad superciliary stripe from lores to sides of nape, together with the anterior malar region black; a naked triangular space behind the eye: bill orange, "feet orange-yellow" — Hartert; wing 116 mm; tail 106; tarsus 38; middle toe with claw 34; culmen from cranial suture 24 (♀ "native collector", Bonthain Peak, 6000 ft., Oct. 1895: Everett — C 14881).

Sexes. The sexes are not known to differ in coloration.

Young. "Has pale shaft-lines on the head, and on the breast and abdomen some feathers with pale centres and dark brown margins, like those of some young Thrushes." "The tarsus is covered with an unbroken lamina in adult birds, only at the lower part a scale or two can be distinguished. In this immature specimen . . . the ridges of the margins of scales can still be distinguished in the middle part of the tarsus!" (Hartert *1*).

Nidification. Unknown.

Distribution. Celebes: Peak of Bonthain (Everett).

This fine mountain-species of Babbler formed, perhaps, the most interesting of Mr. Everett's discoveries on the Peak of Bonthain in 1896. It is very like certain Blackbirds in appearance, though the shape of its wing, as well as the peculiar superciliary stripe of black, at once shows that it has no very near real affinities with *Merula* or *Turdus*. Mr. Ernst Hartert erected the genus *Cataponera* for it, and, as present-day genera go, it is fully entitled to this rank, and, with *Rhabdotorrhinus*, *Pyrrhocentor*, *Myza*, *Cittura*, and others, to be cited as an ancient Celebesian type. Its affinities, according to Hartert, are to be found in the genera *Garrulax*, ranging from the Himalayas to Java, *Rhinocichla* of Sumatra and Borneo, and *Allocotops* of Mt. Kini Balu, Borneo; but it differs from them, and from other allied forms of these regions, in not having the tail graduated, but almost square. *Rhinocichla*, which also seems to be a mountain-haunting genus and strikes us as being most like *Cataponera*, differs by having its tail decurved as well as graduated (the outermost rectrice being 20 mm shorter than the middle ones), and its front toes are relatively much shorter[1]).

GENUS TRICHOSTOMA Blyth.

This genus consists of about half a dozen plain-looking species, with olive, grey, and white as their chief colours, in size rather larger than a Sparrow. Culmen about as long as the cranium, nearly straight, tip bent down and overlapping the mandible from the notch; nostrils oval, posterior walls membranous; rictal bristles large, reaching to the nostril or further; tail rounded, twice as long as the tarsus; middle toe and claw nearly as long as the tarsus; wing blunt, rounded, 4th—8th remiges the longest.

Occurs from South Tenasserim to Java, Borneo, and Celebes.

* 206. TRICHOSTOMA CELEBENSIS (Strickl.).

North Celebes Babbler.

Trichostoma celebense *(1)* Strickl., Contr. Orn. 1849, 127, pl. 35 (front figure); *(2)* Blyth, Ibis 1867, 2 (footnote); *(3)* Wald., Tr. Z. S. 1872, VIII, 113; *(4)* Brüggem., Abh.

[1]) We cannot make out what Dr. Sharpe means, in his diagnosis of this genus, by the expression "outstretched feet falling short of tail by twice the length of the tarsus" (Cat. B. VII, 328). In a skin before us the feet fall short of the tip of the tail by about half the length of the tarsus; from the base of the tail, certainly, they are distant about twice the length of the tarsus. Are Dr. Sharpe's skins prepared in this manner?

Ver. Bremen 1876, V, 63; *(V)* Wald., Ibis 1876, 376, 378, pl. XI, fig. 2; *(6)* Lenz, J. f. O. 1877, 373; *(7)* Meyer, Ibis 1879, 126; *(8)* Büttik., Notes Leyden Mus. 1895, XVII, 88; *(9)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 2, p. 18; *(10)* Hart., Nov. Zool. 1897, 161.

a. **Macronus celebensis** *(1)* Gray, HL. I, 1869, 318, Nr. 4763.

b. **Brachyteryx celebensis** *(1)* W. Blas., J. f. O. 1883, 137.

c. **Turdinus celebensis** *(1)* Sharpe, Cat. B. VII, 1883, 542; *(2)* Guillem., P. Z. S. 1885, 552; *(3)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 12.

"Terrek", near Manado, Guillem. *c 2.*

"Kios", near Manado, Nat. Coll.

"Kore-kore-bia", Mantehage, Lembeh, and Banka, Nat. Coll.

"Sese", Tonkean, E. Celebes, Nat. Coll.

Figures and descriptions. Strickland *I*; Walden *V*; Brüggem. *4*; Sharpe *c 1.*

Adult. Above raw umber, duller and more olive on the head and hind neck, brighter and inclining to russet on the upper tail-coverts; quills dusky brown, externally like the back; tail-feathers dusky brown, externally brighter russet than the upper tail-coverts; chin and throat and abdomen white, becoming olivaceous smoke-grey on the sides of the neck (where it passes over into the brown of the hind neck), breast and sides; the flanks and under wing-coverts strongly tinged with fulvous or wood-brown; thighs and under tail-coverts wood-brown; quills and tail-feathers below dusky brown, where the former rest upon the body pale drab (♂, Kema, 14. IX. 93: Sarasin Coll.).

Iris brown; bill black, under mandible bluish; feet grey-blue (Sarasin Coll.).

Sexes. Sexual differences of coloration do not appear to exist.

Measurements. Wing 70—80 mm ca.; tail 52—60 ca.; tarsus 25—26; bill from nostril 10—11.

Immature. Similar to the adult, but less tawny and duller on the lower back and tail-coverts and redder on the tail, the white of the under surface more extended on sides of neck and middle of breast. Wing (moulting) 64, 70 mm; tail 52; tarsus 25. "Iris brown; bill above black, below yellowish green; feet reddish grey" (♂, Kema, 1. VIII. 93: Sarasin Coll.).

The bird moults (perhaps twice a year?) once about August—September, as shown by two of the Drs. Sarasins' specimens.

Variation. Possibly a racial difference is discernible in the plumage of birds in the East Peninsula. Our single example from Tonkean has, compared with northern specimens, less white on the abdomen and more isabelline-brown on the sides of the head and flanks, spreading also over the breast, where the typical form is greyer.

Distribution. North, West and East Celebes: Minahassa (Meyer *3, 7*, Fischer *4*, Guillemard *c 2*, Nat. Coll. in Dr. Mus., Sarasin Coll.); Mantehage, Banka, Lembeh (Nat. Coll. in Dresd. Mus.); Dongala and Tawaya, W. Celebes (Doherty *10*); Tonkean, E. Celebes (Nat. Coll. in Dresd. Mus.).

This Babbler was until quite recently known only from North Celebes and the islands off the coast, but it has now been recorded from the West and East of the island. It seems to be rather rare in collections and was found by Meyer to be a difficult bird to get, as it has the habit of concealing itself in the interior of low bushes. Its nearest relation is perhaps *T. finschi* of the Macassar district which seems to be its southern representative. This bird may

best be distinguished by its fulvous, not olivaceous grey, breast and sides, and by its having the region round the eye fulvous. *Androphilus castaneus* (Bütt.) of N. Celebes may be known by its white superciliary streak, dark chestnut-umber upper surface and sides and much smaller size, as well as by the rictal bristles being unnoticeably small, and by its having 10 rectrices. Dr. Sharpe places *T. celebensis* between *T. abbotti* (Blyth), which ranges from the Himalayas to Borneo, and *T. gularis* (Sharpe) of West Africa, but Mr. Büttikofer relegates both these species to other genera, and places the Celebesian form next to *T. rostratum* Blyth, of the Malay Peninsula, Sumatra and Borneo.

Mr. Wallace comments upon the rarity of the *Timeliidae* in Celebes (Geogr. Distr. 1876, I, 430), and with right. The only members of the family yet known from the Province are *Malia* (peculiar), *Iole*, *Trichostoma*, *Androphilus*, *Cisticola* (which is better placed among the *Sylviidae*) and looking through the *Timeliine* groups contained in the seventh volume of the Catalogue of Birds alone, we find Dr. Sharpe numbers nearly 80 genera from the Indian Region, while Mr. Everett in his List of the Birds of Borneo (1889, p. 91 sq., J. Str. Br. R. As. S.) names 39 genera (if we count the *Brachypodidae* only as a subfamily of the *Timeliidae*) as occurring in Borneo alone. Australia and Papuasia, though far less wealthy in genera than the Indian Region, are very well off when compared with the strange rarity of these birds in Celebes and the Moluccas. Another curious point is, apparently, the somewhat frequent occurrence of the same genus and closely allied species in the Indian Region and Africa south of the Sahara, while the whole family is known by a very few forms only in the Palaearctic Region. The last point is, however, partly to be explained on the ground that ornithologists have been overcareful to uphold the Palaearctic Thrushes, Warblers, and Shrikes as distinct families, throwing aside their varied host of exotic allies as "Timeliidae". The simplest way of accounting for this rarity of the family in Celebes and the Moluccas and the similarity of some of its forms in Africa and the Indian Region seems to be on the large assumption that its distribution was once much what it is now, but extended further north until the last glacial period, which drove certain forms south of the Sahara and of the Himalayas, while a few non-migratory forms crossed to the islands of Celebes and of the Moluccas. As a few forms of the Indian Region and Australia are identical, though as a rule Australia has its own genera, the further supposition would have to be made that such wandered to Australia at the same time. We have even species belonging to the same genus *(Sphenœacus)*, according to Sharpe, in South Africa and New Zealand.

* 207. TRICHOSTOMA FINSCHI Tweedd.

South Celebes Babbler.

a. **Trichostoma celebense** *(1)* Wald. (nec Strickl.), Tr. Z. S. 1872, VIII, 62; *(2)* Finsch & Conrad, Verh. z.-b. Ges. Wien 1873, 2, 9 (sep. copy); *(3)* Büttik., Notes Leyden

Mus. 1895, XVII, 88; *(4)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 12; *(5)* Hart., Nov. Zool. 1896, 151; *(6)* id., ib. 1897, 155, 159, 161.

Trichostoma finschi *(1)* Wald., Ibis 1876, 378, pl. XI, fig. 1.

b. **Turdinus finschi** *(1)* Sharpe, Cat. B. VII, 1883, 543; *(2)* Büttik., Zool. Erg. Weber's Reise in Ost-Ind. 1893, III, 276.

Figure and descriptions. Walden *1*, Sharpe *b 1.*

Adult male. Head above and mantle olive-brown, gradually changing into ferruginous-brown on the upper tail-coverts and external edges of the rectrices; wings dull olive-brown, the coverts edged with the colour of the back, the remiges externally rather paler; under surface rufous-buff, browner on the sides, greyer on the sides of the breast, more cinnamon on the under tail- and wing-coverts, clearing into whitish on the chin and throat and middle of abdomen; lores whitish, more fulvous round the eye; ear-coverts grey-brown with pale shaft-lines; "iris pale red-brown; feet pale purplish; maxilla blackish, mandible bluish horn-colour" — Doherty (♂, Macassar, 3. VI. 95: Sarasin Coll.).

Female. Like the male in coloration, but smaller (♀, Macassar, 29. VIII. 95: P.& F. S.).

Measurements (4 examples: Macassar: P.& F. S.). Wing (2 ♂♂) 75, 77 mm, (2 ♀♀) 68, 71; tail ♂ 55, ♀ 50, 52; tarsus c. 27, bill from nostril 10.5—11.

Distribution. South Celebes — Macassar (Wallace *1*, *b 1*, *a 1*, Conrad *a 2*, *1*, etc.), low country near Bonthain (Doherty *a 6*); West Celebes — Palos Bay *(a 6).*

This species may be distinguished from *T. celebensis* of North Celebes by the tawny-buff tint of the sides of the body, the fulvous colour round the eye and the different tint of the upper surface. Until the visits of the Sarasins, Everett and Doherty, only four specimens of it had been recorded, but Mr. Doherty sent more examples of it than of any other bird from Macassar. Dr. Sharpe places the bird between two West African species, *T. gularis* (Sharpe) and *T. rufescens* (Rchw.), from both of which it differs by its tawny under-parts, but Mr. Büttikofer points out some small structural differences, which lead him to place the African species in a different genus, *Illadopsis.* The curious correspondence of the members of several genera of *Timeliidae* in East India and Africa south of the Sahara has been already commented upon in the foregoing article.

GENUS MALACOPTERON Eyt.

Differs from *Trichostoma* chiefly by its long wing and small tarsus and foot. As Büttikofer shows, the tail, which is rounded, is three times the length of the tarsus. The feathers of the forehead grow as far as the nostril, which is screened with bristles; the rictal bristles are large, reaching to within $^1/_4$ of the tip of the bill. If not a Flycatcher, it is a very near approach thereto.

Range: Malay Peninsula to Java, Borneo, Palawan, Celebes.

208. MALACOPTERON AFFINE (Blyth).

Malacca Babbler.

a. **Trichastoma affine** *(1)* Blyth, J. A. S. B. 1842, XI, 795.
Malacopteron affine *(1)* Gray, Gen. B. I, 209 (1846); *(2)* Büttik., Notes Leyden Mus. 1895, XVII, 105; *(3)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 2, p. 17.
b. **Setaria affinis** *(1)* Salvad., Cat. Ucc. Borneo 1874, 231.
c. **Malacopterum affine** *(1)* Sharpe, Cat. B. VII, 1883, 569.
For further synonymy and references cf. Salvadori *b 1*; Sharpe *c 1*; Büttikofer *2*.
Description. Sharpe *c 1*.
Young. Above olive-brown, greyer on head and neck, with a cinnamon tinge on rump; tail dull chestnut, the edges brighter; wings dusky, externally brighter brown than above, lightest on the edges and tips of the wing-coverts and innermost remiges, the last with very obscure and imperfect bars; lores whitish; ear-coverts brown, with whitish shafts; below pale broccoli-brown, clearing into whitish on the chin and throat, and buff-whitish on abdomen; under wing-coverts and inner edgings of quills below rather more fulvous: bill dark, tomia pale; legs, feet and claws pale brown. Wing 74 mm; tail 62; tarsus 19; exposed culmen 11, from suture 16 (Tonkean, E. Celebes, V.—VIII. 95 — C 14405).
Adult. Has the head above sooty brown, the throat and under parts white, shaded with ashy on the breast and sides (fide Sharpe and Büttikofer).
Distribution. Malay Peninsula (Blyth *a 1*, *b 1*, Cantor *b 1*, *c 1*, etc.); Sumatra (Wallace *c 1*); Banka (Mus. Leyden *2*); Java (Mus. Leyden *2*); Borneo (Low etc. *c 1*, *b 1*, *2*); Celebes — Macassar (Teijsmann *2*), Tonkean, E. Celebes (Nat. Coll. *3*).

Two specimens only are known from Celebes, one in the Leyden, the other a young one in the Dresden Museum. In the case of Teijsmann's example it seems possible, as in other cases, that the island of Saleyer may have been the true habitat. From Mr. Büttikofer's valuable revision of the genus *Turdinus* and its allies, it would appear that *M. magnirostre* (Moore), ranging from Tenasserim to Borneo, and *M. kalulongae* Sharpe, of the mountain regions of Sarawak and Central Borneo, are its nearest relatives: both of these have a dark moustachial streak, and the crown of the latter its dusky grey, of the former olive like the back.

FAMILY TURDIDAE.

The true Thrushes are partly terrestrial in habits, their food consisting of grubs and insects, sought on the ground, and of fruit. Their tarsi and feet are rather large and strong, and they both run and hop with buoyancy and quickness. It is preferable, perhaps, to restrict the family to the true Thrushes (*Turdus*, *Merula*, *Geocichla*, *Mimocichla* and perhaps *Monticola* and *Petrophila*), for *Saxicola* and *Myrmecocichla* form transitions to the Redstarts and Flycatchers, and *Cataponera* and probably *Catharus* to the *Timeliidae*.

The wing of the *Turdidae* is rather pointed, the first primary minute, the second longer than the secondaries, which fall short of the tip of the wing by $^1/_3$ to $^1/_4$ its length. The young wear a spotted or mottled plumage.

GENUS GEOCICHLA Kuhl.

Structurally like *Merula*, but the tail a little shorter and the bill somewhat broader; recognisable by the broad band of white across the wing below on the base of the secondaries and of some of the primaries.

Found in Africa, Asia to Australia and N. America, accidental in Europe.

* 209. GEOCICHLA ERYTHRONOTA Scl.

Celebes Ground-thrush.

Geocichla erythronota *(1)* Sclat., Ibis 1859, 113; *(II)* Wald., Tr. Z. S. 1872, VIII, 61, 113, pl. VI, fig. 2; *(3)* Brügg., Abh. Ver. Bremen V, 1876, 63; *(4)* Meyer, Ibis 1879, 125; *(5)* Seeb., Cat. B. V, 1881, 165; *(6)* H. O. Forbes, P. Z. S. 1883, 588; *(7)* Guillem., P. Z. S. 1885, 552; *(8)* Platen, Gefied. Welt 1887, 219; *(9)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 13; *(10)* Hart., Nov. Zool. 1896, 556; *(11)* id., ib. 1897, 161; *(XII)* Meyer, Vogelskel. 1897, II, pl. CCXVII.

a. **Turdus erythronotus** *(1)* Gray, HL. I, 1869, 260, Nr. 3795; *(2)* Rosenb., Malay. Archip. 1878, 272.

"Moupu burik", Manado, Guillemard *7*.

Figures and descriptions. Walden *II*; Meyer *XII* (skel.); Sclater *1*; Seebohm *5*.

Nearly adult. Above chestnut, browner on head, more ochraceous on rump and upper tail-coverts; wings and tail blackish; the middle and greater wing-coverts tipped with white, forming two bars; the basal third of the secondaries and rather more of the inner webs of the primaries (except the three outermost) white; the three outer tail-feathers tipped with white, the outermost very broadly, the third very slightly; two patches on loral and malar region and on the ear-coverts white, remainder of sides of head, submalar region and chest black, the last bordered by a buff band, succeeded by a black one; throat mostly white; remaining under-parts white, marked on the abdomen and sides with broad spots of black; flanks washed with rufous; under wing-coverts white, the terminal part black (Celebes, Nr. 1914).

Adult. Answers to the above description, but has the throat as well as the upper breast black, and the band below this white, not buff. A male, kindly lent to us by Mr. A. Nehrkorn, and one in the Sarasin Collection have the head slightly intermixed with black, the middle of abdomen clear of black cross-bars, which occur, however, on the flanks, as in Lord Walden's plate. "Iris dark slaty feet nearly white" (Meyer *4*). "Bill horn-grey; feet yellowish brown; iris brown" (Platen in Mus. Nehrk.).

Measurements.	Wing	Tail	Tarsus	Bill from nostril
a. (Mus. Nehrk., Nr. 972) ♂, Rurukan, 28. VIII. 84 .	112	76	32	—
b. (Nr. 1914) imm., Celebes	113	81	32	12
c. (C 13869) ad., Lotta, Minahassa, 1. XII. 94 (Nat. Coll.)	116	79	32	12
d. (Sarasin Coll.) ♂ ad., Tomohon, 16. IV. 94 . . .	121	84	30	12
e. (Sarasin Coll.) ♀ ad., Rurukan, 24. III. 94 . . .	115	77	33	12

Distribution. S. Celebes — Macassar (Wall. *1, 5*); N. Celebes — Minahassa (Meyer *4*, Guillemard *7*, Platen *8*, P. & F. Sarasin); W. Celebes — Tawaya (Doherty *11*).

Fischer also sent four examples of this Thrush from some parts of the Minahassa, but up to the present specimens are rare in collections. Meyer, who met with it at three places near Manado, including the churchyard of the Europeans there, remarked that it lived on the ground, was very shy and only to be shot from far. Platen met with it in a journey from Rurukan to Mount Klabat on the banks of a marsh in the virgin forest, and the Sarasins got it at Rurukan and Tomohon. Beetles were found in the stomach by Meyer.

G. erythronota is most like *G. dohertyi* Hart. of Lombok, which has a black head. *G. interpres* Temm. of Java, Sumatra and Lombok, with which species Mr. Oates (Faun. Br. Ind. B. II 1890, 138) believes *G. avensis* of Malacca to be identical, may, as Seebohm points out, be distinguished by its having the back, rump, wings and tail brown or slate-grey, the former colour being apparently that of the females, or a seasonal or immature dress. Mr. H. O. Forbes *(6)* describes his *G. machiki* of Timorlaut as intermediate between *G. erythronota* and *G. rubiginosa* S. Müll. (= *G. peroni* V.) of Timor, but it is at once distinguished by its chin, throat and breast, which are buffish white, not black.

GENUS MERULA Leach.

The genus *Merula* is separable from *Turdus* only as a "colour-genus", the adult males of the former having lost all appearance of spots, and the sexes are usually dissimilar.

Culmen about as long as the cranium; tomia slightly notched; rictal bristles moderate; wing pointed, moderately long, the tip formed by the 3rd—5th primaries, the 2nd rather shorter, the 1st very small; tarsi and feet moderately large; tail shorter than wing, square.

Range: Europe, Asia to Australia, South America. Many, if not all, of the tropical species are inhabitants of the mountains.

* 210. MERULA CELEBENSIS Bütt.

Celebes Blackbird.

Plate XXXV.

Merula celebensis *(1)* Büttik., Notes Leyden Mus. 1893, XV, 109; *(2)* Seeb., Ibis 1893, 222; *(3)* Hart., Nov. Zool. 1896, 150, 165; *(4)* id., ib. 1897, 155.

Adult male. Upper surface sepia (greener in a second example), darkest on the upper tail-coverts and primaries, tail itself blackish, palest and more olivaceous towards the forehead; face, throat and chest, under wing-coverts and thighs similar grey-brown, but paler; flanks and under tail-coverts more olivaceous, the latter with whitish mesial streaks and tips, and the longest flank-feathers mostly white; lower breast, abdomen, and sides dark orange-rufous; remiges below shining dusky, with pale shafts; tail below blacker (♂, Lompo Batang, S. Cel., c. 2000 m, 16. X. 95: P. & F. Sarasin).

"Bill yellow, above blackish; eyelid sulphur-yellow; iris sepia; legs yellow-brown" (P. & F. S.).

Female. Browner on the breast (Hartert).

Young. Above warmer brown (bistre) than the adult, darkest on the head, palest on the rump, tail blackish; on the mantle and scapulars some fulvous shaft-streaks; the wing-coverts with rufous tips; under-parts rufous, less clear than in the adult, spotted with dusky, most thickly on the breast; crissum whitish; thighs grey-brown and cinnamon; superciliary stripe, eyelid, and submalar stripe fulvous rufous, below the last a dark stripe on either side of the throat (♂ juv., Lompo Batang, c. 2400 m, 6. XI. 95: P. & F. Sarasin).

Measurements.	Wing	Tail	Tarsus	Bill from nostril
a. (Sarasin Coll.) ♂ ad., Lompo Batang, c. 2000 m, 16. X. 95	126	96	34	13
b. (Sarasin Coll.) ad., Lompo Batang, c. 2600 m, 15. X. 95	126	92	34	—
c. (Sarasin Coll.) ♂ juv., Lompo Batang, c. 2400 m, 6. XI. 95	121	92	35	13.5
d. (Sarasin Coll.) ♂ juv., Lompo Batang, c. 2400 m, 6. XI. 95	123	91	35	12

Distribution. South Celebes (Teijsmann *1*), Bonthain Mountains (P. & F. Sarasin, Everett *3*, Doherty *4*).

It is pointed out by Mr. Büttikofer that this species is "very closely allied to *M. javanica*, but more olive-green, instead of brown, on back, rump, upper tail-coverts, upper wing-coverts and scapulars, the chestnut colour on the under surface richer and reaching higher, covering the whole breast, and the white subterminal spots on the sides of the rump much larger and more numerous".

Other species nearly related to it are *M. whiteheadi* Seeb. of East Java, distinguishable from the West Javan form by the much more pronounced whiteness of its head; *M. seebohmi* Sharpe of Kini Balu, Borneo, of a blacker plumage; *M. schlegeli* (Sclat.) of Timor, pale above, with the entire abdomen and anal region chestnut like the breast and sides, not white; *M. celaenops* Stejn. of the Parry and Bonin Islands, also, according to Seebohm, an allied form, with a black head and neck in the male sex. Seebohm remarks that in the tropics the species of the genus *Merula* seek the greatest elevations that they can find. Thus, *M. javanica* is known from an elevation of 8000—10,000 feet in West Java, *M. whiteheadi* from 7000 feet in East Java, *M. seebohmi* is most plentiful at 9000 feet on Kini Balu, was never observed below 8000, but was seen as high as 12,000 feet (Whitehead, Ibis 1889, 268), *M. schlegeli* was obtained by Salomon Müller in the Penpoan Valley in the mountainous interior of Timor (Büttikofer). Although the type of *M. celebensis* is labelled "Macassar" it is more likely that it came from the high mountains 20—30 miles away in the interior of the Southern Peninsula, where Lompo Batang attains to a height of nearly 10,000 feet. On these mountains at heights of 6000 feet and upwards it was found by the Sarasins, Everett, and Doherty.

GENUS PETROPHILA Sw.

These Rock-thrushes differ from *Merula* in having a straight wing, not incurved to fit the body, and black feet and tarsi, whereas in *Merula* they are generally yellow or brown. The males of *Petrophila* have much blue in their plumage, the females are not spotted below, but marked with irregularly shaped bars. Mr. Oates separates the typical Rock-thrush, *Monticola*, from *Petrophila* in virtue of the short tail, the wing of the former being double the tail-length.

211. PETROPHILA CYANUS (L.).

Blue Rock-thrush.

The investigations of Dresser (Birds Eur. II, 1872, 150—163), Hume (Str. Feath 1875 III, 112—114), Seebohm (Cat. Birds V, 1881, 316—320), Oates (B. Brit. Burmah 1883 I, 11), Fauna Br. Ind. Birds 1890, II, 146, 147), W. Blasius (Ztschr. ges. Orn. 1886, 99 and Ornis 1888, 603), Styan (Ibis 1887, 217; 1891, 334), and others, satisfactorily prove that this species embraces two remarkably different extreme geographical races, which are inseparably connected with one another by intermediate forms. They are:

1. The typical Petrophila cyanus.

For syonymy cf Seebohm l. c.

Diagnosis. Abdomen blue, like the rest of the plumage.

Distribution. From S. Europe, east to China, migrating in winter to North Africa, India, Ceylon, Burmah.

2. Petrophila cyanus solitaria (P. L. S. Müll.).

a. **Monticola solitarius** (P. L. S. M.); *(1)* Wald., Tr. Z. S. 1872, VIII, 63; *(2)* id., Tr. Z. S. 1875, IX, 192; *(3)* Brügg., Abh. Ver. Bremen 1876, V, 66; *(4)* Salvad., Ann. Mus. Civ. Gen. 1876, IX, 59; *(V)* David & Oust., Ois. Chine 1877, 161, pl. 41; *(5bis)* Wald., P. Z. S. 1877, 696; *(6)* id., ib. 1878, 343, 380, 619, 949; *(7)* Blak. & Pryer, Ibis 1878, 240; *(8)* Salvad., Orn. Pap. II, 1881, 418; *(9)* Seeb., Cat. B. V, 1881, 319; *(10)* A. Müll., J. f. O. 1882, 357; *(11)* H. Slat., Ibis 1883, 224; *(12)* W. Blas., Ztschr. ges. Orn. 1886, 99; *(13)* Styan, Ibis 1887, 217; *(14)* Sharpe, Ibis 1888, 201; *(14bis)* Tacz., P. Z. S. 1888, 463; *(15)* W. Blas., Ornis 1888, 603; *(16)* Sharpe, Ibis 1889, 269; *(17)* Everett, J. Str. Br. R. A. S. 1889, 98; *(18)* Whitehead, Ibis 1890, 58; *(19)* Steere, List B. & M. Philipp. Is. 1890, 19; *(20)* Salvad., Orn. Pap. Agg. 1890, 137; *(21)* Styan, Ibis 1891, 333; *(22)* Hartert, J. f. O. 1891, 201; *(23)* Tacz., Faun. Orn. Sib. Orient. I, 1891, 321; *(24)* De La Touche, Ibis 1892, 413; *(25)* Styan, Ibis 1893, 427; *(26)* M. & Wg., J. f. O. 1894 247; *(27)* Grant, Ibis 1894, 509; *(28)* Bourns & Worces., B. Menage Exped. 1894, 40; *(29)* Everett, Ibis 1895, 23.

b. **Petrocossyphus solitarius** *(1)* Sh. & Dress., B. Eur. II, 141 (1871), 150—163 (1872).

c. **Cyanocincla solitaria** *(1)* Hume, Str. F. 1875, III, 112; *(2)* Hume & Dav., ib. VI, 1878, 250, 512.

d. **Petrocincla manilla** (Bodd.) *(1)* Tacz., B. Soc. Z. France 1879, 136.

e. **Monticola saxatilis** *(1)* H. Slat. (nec L.), Ibis 1882, 433.

f. **Monticola cyanus solitarius** *(1)* Seeb., Ibis 1883, 121; *(2)* id., Ibis 1884, 263; *(3)* id., Ibis 1890, 98; *(4)* id., Ibis 1892, 89; *(4bis)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 13; *(5)* Hart., Nov. Zool. 1894, 469.

g. **Monticola cyanus** pt. *(1)* Oates, B. Brit. Burmah, 1883, I, 11; *(2)* Seeb., B. Japan. Emp. 1890, 53; *(3)* id., Ibis 1893, 48.

h. **Petrophila solitaria** *(1)* Oates, Faun. Br. Ind. B. II, 1890, 145.

"Ainaourida taigej", Talaut, Nat. Coll.

"Burong dona" (♂ ad.) or **"Maspas lolaro"** (♀ or young), Manado tua, Nat. Coll.

"Maspas batu", Minahassa, near Likupang, iid.

For further synonymy see Salvadori *a 8*, Seebohm *a 9*.

Figure and descriptions. David & Oustalet *a V*; Seebohm *a 9*; W. Blasius *a 12*; Hume *c 1*; Oates *g 1*, *h 1*.

Diagnosis. Abdomen (of adult male) chestnut.

Adult [male]. Upper surface with throat and breast greyish China-blue, a few obscure pale terminal edgings on back, scapulars and breast; tail and quills black, bordered with bluish except towards the ends of the feathers; abdomen, sides, under wing-coverts and under tail-coverts light chestnut, almost hazel, some of the feathers with buff terminal margins; flanks bluish; quills and tail below dusky (Manado tua, 13. IV. 94: Nat. Coll. — C 12140). Iris brown; bill and feet black (Platen *a 15*).

Count Salvadori *(a 8)* has described the above dress as immature plumage, and that of *M. cyanus* as the adult. Prof. Blasius *(a 12, a 15)* reasons at some length that the following, however, is the plumage of the young male and the female, and we agree with him, Seebohm, Oates, and others in holding this to be the case.

Adult female. Above hair-brown, washed with blue, most strongly on the mantle, back and wing- and tail-coverts, the feathers of these parts with dark shaft-streaks and barred with subterminal markings of black, the tip more fawn-colour, hardly perceptible on head and neck; quills and greater wing-coverts dusky, with brownish white tips and edgings; tail blackish brown with paler edgings and tip; under surface pale fawn, whitest on throat, more cinnamon on under wing- and tail-coverts, barred all over with subterminal **U**-shaped markings of blackish brown — on the throat one bar, sometimes with an imperfect inner one, on the breast one bar within another, on the flanks two or three bars (♀ Luzon: Schadenberg — C 8816; [♀] Great Sangi: Meyer — C 3648). Iris brown; bill and feet dark brown (Platen *a 15*).

Young male (Sarasin Coll., Nr. 107, from Kema). Like the female.

Immature [male]. Bluer above than the female, under-parts blue down to the breast, bright chestnut from abdomen downwards, except on flanks, barred almost all over with dusky, with the tips whitish, and sometimes the part of the feather before the bar whitish or blue (Talaut: Nat. Coll. — C 13124).

Measurements. Wing 116—125 mm; tail 75—85; tarsus 30c; bill from nostril 15—17.

Eggs. "Uniform blue, having at the large end a perceptible circlet of fine reddish brown spots (after examples from China). Measurements: 24—25 × 18—18.5 mm" (Nehrkorn MS.).

Distribution. Askold Id., Manchuria (Jankowski *d 1*); Corea (Kalinowski *a 14bis*); Japan (Whitely, etc. *g 2*, *a 8*); Loo-choo Is. (Rodgers, Pryer *g 2*); Bonin Is. (Holst *f 3*, *g 2*); China (Swinh. *a 8*, Styan *a 13* etc.); [Formosa (Swinh. *a 8*)]; Hainan (Swinh. *a 8*, Styan *a 24*); [Nepal, Sikhim, Dacca, Andamans, Burmah and Tenasserim (Oates *h 1*)]; Siam (Schomburgk *a 8*); Cochin China (Pierre *a 9*); Malay Peninsula (Maingay *a 8*); Java (Gray *a 8*); Natuna Is. (Everett *f 5*); Borneo (Everett, Ussher *a 17*); Philippines (Steere, etc. *a 22*, *a 28*); Talaut (Nat. Coll. *a 25*); Great

Sangi (Rosenberg, Bruijn *a 15*, etc.); North Celebes (Forsten, Rosenb. *a 8*, Sarasins), Manado tua (Nat. Coll.); Ternate and Tidore (Salvadori *a 8*).

Intermediate birds, *P. cyanus—solitaria*, also occur, of course in winter, in the East India Islands, as shown by Henry Seebohm *(a 9)*, and the type of *P. erythroptera* (Gray), obtained by Mr. Wallace in Halmahera, is one such. The *typical cyanus* appears to range from South Europe as far as India where it begins to pass over into *cyanus solitaria*, and Mr. Oates *(h 1)*, shows that in Tenasserim, though the proportion is lessened, the *typical cyanus* is still predominant. The true *cyanus solitaria* seems to prevail only on the east coast of Asia and the islands. In the above sketch of the distribution of the subspecies some of the localities may rest upon intermediate forms; where this is certainly the case square brackets have been used.

The species is known only as a winter visitant to India, Burmah and Tenasserim. In South China at Foochow and Swatow Mr. J. De La Touche remarks that it is very common, and resident; in Central China, the lower Yang-tse basin, Mr. Styan has observed it in winter as well as in summer. It is known to breed in the Province of Pekin (David) and in Corea *(a 14bis)* but apparently is not resident there. Seebohm observes that it is a common summer visitor to all the Japanese Islands, and is occasionally seen in winter in Southern Japan. It is a common bird, according to Mr. Holst *(f 3)*, in the Bonin Islands, where it breeds. On the other hand all the dates which we have seen (up to the end of July, 1894) relating to specimens killed in the Southern Philippines and other East Indies, upwards of 41 in number (where the number of specimens is not definitely mentioned only one is reckoned, though in some cases a larger number was almost certainly obtained, and this would swell the total considerably) are in the winter months from September to the end of April; we have found no mention of specimens shot here in summer. In his paper on the birds of Palawan *(a 18)*, Mr. Whitehead notes it as "a winter migrant, arriving about the 26th September". In Luzon it is possibly, as in South China, a resident, for Prof. Steere notes it as having been obtained there, where he collected in July.

The eastern, like the western race, is said by David to be prized for the sweetness of its song. Insects seem to be the chief food of this species, but a caged specimen was found by Lord Lilford *(b 1)* to be almost omnivorous.

FAMILY SYLVIIDAE.

The name *Sylviidae*, or Warblers, belongs to a great group of small insectivorous birds, for the most part of plain plumage and the sexes generally similar. The young are not barred, squamated, or spotted below but often suffused with a richer colour than the adults; this character may help to distinguish them from the Flycatchers and Thrushes. Still genera are found

which render it practically impossible to draw a clear line between them and those families and the *Timeliidae*, and it is hard to say what good purpose is served by upholding them all as families.

In Wallace's "Geographical Distribution of Animals" 1876, II, pp. 256—260, Canon Tristram divides the *Sylviidae* into 7 subfamilies, of which three occur in Celebes. The *Drymoecinae*, to which *Cisticola* and *Phyllergates* belong, have long shanks and fan-tails, often inhabiting scrub and grass; the *Calamoherpinae*, pre-eminently the Reed-Warblers, including *Acrocephalus* and *Locustella*; the *Phylloscopinae*, more arboreal in habits, though nesting on or near the ground, including *Phylloscopus* and, perhaps, *Cryptolopha*.

GENUS CISTICOLA Kaup.

Bill not notched, shorter than the cranium, two rictal bristles; tail of 12 feathers, fan-shaped; wing rounded, 1st quill small, less than half the length of the 2nd, the 2nd as long as the secondaries, 3rd—6th the longest; tarsus long, longer than the middle toe; in colour, as the feet, flesh-colour, yellowish or reddish.

Birds of very small size, to be found in the open, in long scrubby grass, and such like; ranging from Africa, Madagascar, Southern Europe, temperate (ex parte?) and tropical Asia, through the East India Archipelago to Australia.

212. CISTICOLA CURSITANS (Frkl.).

Rufous Fan-tailed Warbler.

a. **Sylvia cisticola** *(1)* Temm., Man. d'Orn. 1820, I, 228.

b. **Prinia cursitans** *(1)* Frankl., P. Z. S. 1831, 118.

c. **Salicaria cisticola** *(I)* Gld., B. Eur. 1837, pl. 113.

d. **Cisticola schoenicola** Bp. *(1)* David & Oust., Ois. Chine 1877, 256; *(2)* Seeb., Ibis 1884, 261; *(3)* Guill., Ibis 1888, 110; *(4)* Koenig, J. f. O. 1888, 193; *(5)* id., ib. 1892, 392.

Cisticola cursitans *(1)* Wald., Tr. Z. S. 1872, VIII, 64; *(II)* Dresser, B. Eur. III, 3, pl. 96 (1877), *(3)* Hume & Davis., Str. F. VI, 1878, 349; *(4)* Tweedd., P. Z. S. 1878, 708, 710; *(5)* Hume, Str. F. VIII, 1879, 64; *(6)* Legge, B. Ceylon 1880, 531; *(7)* Wardl. Rams., Tweedd. Orn. Works 1881, App. 658; *(8)* Reid, Str. F. X, 1881, 46; *(8bis)* Kelham, Ibis 1881, 516; *(9)* Oates, t. c. 1882, 219; *(10)* Davison, t. c. 1882, 309; 1883, 391; *(11)* Vorderm., N. T. Ned. Ind. 1883, XLIII, 97; *(12)* Wardl. Rams., Ibis 1886, 160; *(13)* Tait, Ibis 1887, 95; *(XIIIbis)* Gigl. & Manz., Icon. Avif. Ital., pl. XXXVIII (1888); *(14)* Lilford, Ibis 1889, 318; *(15)* Tristr., Cat. Coll. B. 1889, 156; *(16)* Oates ed. Hume's Nests & Eggs Ind. B. I, 1889, 236; *(17)* Oates, Faun. Brit. Ind. 1890, I, 374; *(18)* Heine & Rchw., Nomencl. Mus. Hein. 1890, 29; *(19)* Vorderm., Notes Leyd. Mus. 1891, 128; *(20)* id., N. T. Ned. Ind. 1891, L, 496; *(21)* Rchw., J. f. O. 1892, 56; *(22)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 12; *(23)* iid., ib. 1896, Nr. 2, p. 18.

e. **Cisticola cisticola** *(1)* Oates, B. Br. Burmah 1883, I, 115; *(2)* Sharpe, Cat. B. VII, 1883, 259; *(3)* Seeb., Ibis 1884, 40; *(4)* Styan, Ibis 1887, 220; *(5)* Shelley, P. Z. S. 1888,

23; *(6)* Sharpe, Ibis 1888, 201; *(7)* Everett, P. Z. S. 1889 224; *(8)* id., J. Str. Br. R. A. S. 1889, 102; *(9)* Hartert, J. f. O. 1889, 349; *(10)* Whitehead, Ibis 1890, 51; *(11)* Seeb., B. Japan. Emp. 1890, 77; *(11bis)* Steere, List Coll. B. & M. Philipp. Is. 1890, 20; *(12)* Hartert, Kat. Vog. Slg. Senckenb. Mus. 1891, 17; *(13)* Styan, Ibis 1891, 317, 320, 335; *(14)* Büttik., Notes Leyd. Mus. 1892, 197; *(15)* De La Touche, Ibis 1892, 417; *(16)* Seeb., Ibis 1893, 48; *(17)* Styan, t. c. 428; *(18)* Grant, Ibis 1894, 505; *(19)* Bourns & Worces., B. Menage Exp. 1894, 39; *(20)* Hart., Nov. Zool. 1896, 151, 557, 566, 574, 580, 593; *(21)* id., ib. 1897, 155.

f. **Cisticola oryziola** (S. Müll?); *(1)* Meyer, Isis, Dresden 1884, 46.

For synonymy and further references see Sharpe *e 2*.

Figures and descriptions. Dresser *II*; Gould *c I*; Legge *6*; David & Oustalet *d 1*; Vorderman *11*; Oates *e 1*, *17*; Sharpe *e 2*.

Adult. Fulvous- or wood-brown, the middles of the feathers on head above blackish, on hind neck paler and more obscure; mantle and inner quills more drab-brown with blackish centres; rump and upper tail-coverts and exposed edges of the other quills and wing-coverts cinnamon; tail olive-brown with narrow obsolete bars, an obscure broad subterminal bar black, tip brownish white; ear-coverts fulvous brown, lores and superciliary stripe buff white; under-parts white, washed with rufous buff on sides of throat, breast, and under wing-coverts, becoming deep rufous buff on sides, flanks and thighs, rather paler on under tail-coverts; tail below pale brown crossed by a broad subterminal bar of blackish, tip whitish (Java: v. Schierbrand — C 9166). Wing 53 mm; tail 44; tarsus 20; bill from nostril 7.5.

Young. "The young are more rufous than the adults, the black stripes on the upper plumage being narrower and the rufous edgings broader" (Oates *f 1*).

Eggs. Marked most densely towards the large end with red, reddish-purple and pale purple specks on a white, faint pearly or greenish white ground (India). The average measurements of Indian specimens recorded by Hume *(16)* are 15 × 11.7 mm, and the usual number laid is five.

Nest. The nest is described as a deep narrow purse about 3 inches in depth, 1 inch in diameter at top, and 1.5 inch at the broadest part below, internally closely felted with silky down, externally of grasses, cobwebs and fine vegetable fibres, with which it is worked into a patch of fine-stemmed grass of $1^1/_2$—2 feet high, at a height of about 6—8 inches from the ground (Hume *16*). See also nests from Java (Meyer *f 1*), some of which are also felted with silky down.

Distribution. S. Europe; Africa; Asia Minor; Palestine (Tristram *II*); India (Hume etc. *16*); Ceylon (Legge etc. *6*); Burmah and Tenasserim (Oates *e 1*, Davison *3*); Nicobars (Wimberley *e 2*, Hume *II*); Central and Southern China (David *d 1*, Styan *e 13*, De La Touche *e 15*); Southern Japan (Pryer etc. *e 11*); Loochoo Islands (fide Seebohm *e 11*, *e 16*); Formosa and Hainan (Swinhoe *II*); Philippines — Luzon (Maitland-Heriot *12*, Steere *e 11bis*), North Bohol (Everett *4*), Palawan (Whitehead *e 6*, *e 10*), Mindanao (Bourns & Worcester *e 19*); Malay Peninsula (Hume *5*, Oates *e 1*); Singapore (Hume *5*, Kelham *8bis*); Sumatra (Hartert *e 9*); Billiton (Vorderman *19*, *20*); Java (v. Schierbrand *e 1*, Vorderman *11*); Lombok (Doherty and Everett *e 20*); Sumbawa (Doherty *e 20*); Sumba (ten Kate *e 14*); Flores (Wallace *e 2*); Timor (Wall. *e 2*); Celebes — Macassar (Wall. *1*, *e 2*, Everett *e 20*); Mount. Bonthain (Doherty *e 21*); Lake Posso (P. & F. Sarasin *22*); Peling Id. (Nat. Coll. *23*).

In keeping the birds of the above broad area under one name we follow Dresser, Legge, Sharpe, and Oates. This appears to be the wisest course,

until some one will take the whole matter in hand and devote a few weeks of investigation to show where and what local differences are most pronounced. Several such have been hinted at and unsatisfactory species named by naturalists with whom the seasonal and individual variations of plumage of *C. cursitans* do not seem to have been sufficiently familiar, and these forms have been re-embodied under the old name after broader studies by Mr. Dresser and Dr. Sharpe. The specimen separated by Count Salvadori (Ann. Mus. Civ. Gen. 1875 VII, 663) as *C. celebensis* does not seem to be a race of *C. cursitans*, but a female or young of the species broadly spoken of as *C. exilis*; a form with which Mr. Büttikofer identifies it (Weber's Reise III, 277). If this be so, the only evidence of the occurrence of *C. cursitans* in the Celebes area rested for years upon a male specimen in the British Museum, thus identified by Walden *(1)* and Dr. Sharpe *(e 2)*, for Meyer's record of the species from Togian *(5)* we now believe to relate to the next species, *C. exilis*; but it has recently been found in South and Central Celebes and Peling Id., by the Sarasins, Everett, Doherty, and our native hunters. In 1894 it had only been recorded three times from Luzon, once (one specimen) from Bohol, once from Palawan, not at all from Borneo, and notices of its occurrence in the Lesser Sunda Islands, Sumatra and Java are equally hard to find, though there is a large series of nests with eggs and birds from Java in the Dresden Museum. At Singapore Mr. Kelham found it abundant. In Central China it is mainly a migrant: "immense numbers" says Mr. Styan, "appear in April to breed and pass the summer with us", but in South China (Swatow) Mr. De La Touche describes it as a common winter visitant, and it is quite possible that the scanty examples which have been obtained in some of the East Indies owe their presence there to migration from some part of S. E. Asia, though, on the other hand, the specimens of nests in the Dresden Museum prove that the species breeds in Java.

The habits of this little bird are well described by Legge *(6)*, Hume *(16)*, Koenig *(d 4, d 5)*, and others.

213. CISTICOLA EXILIS (Vig. Horsf.).

Tawny-headed Fan-tail Warbler.

a. **Cisticola grayi** *(1)* Wald., Ann. N. H. 1872, IX, 400; *(2)* id., Tr. Z. S. 1872, VIII, 117; *(3)* Meyer, J. f. O. 1873, 405; *(4)* Tweedd., P. Z. S. 1878, 296.

b. **Cisticola celebensis** *(1)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 663; *(2)* W. Blas., J. f. O. 1883, 113, 119.

c. **Cisticola cursitans** *(1)* Meyer (nec Frankl.), Ibis 1879, 146.

Cisticola exilis *(1)* Büttik., Zool. Erg. Weber's Reise Ost-Ind. 1893, III, 277; *(2)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 13; *(3)* iid., ib. 1896, Nr. 1, p. 12; *(4)* iid., ib. 1896, Nr. 2, p. 18; *(5)* Hart., Nov. Zool. 1897, 161.

"Burong kano kano", Minahassa, Nat. Coll.

The above references bear upon the locality Celebes only.

Figures and descriptions. Gould, B. Austr. III, pl. 42 *(exilis)*, pl. 43 *(lineicapilla)*, pl. 44 *(isura)*, pl. 45 *(ruficeps)* — if fully identical with Celebes birds; Sharpe, Cat. B. VII, 270, 271; Walden *a 1*; Salvadori *b 1*.

Adult [male in breeding plumage]. Head above raw sienna, rump and upper tail-coverts cinnamon; hind neck, mantle and upper wing-coverts broccoli-brown, the mesial part of the feathers black; quills and tail blackish, externally edged and tipped with cinnamon; lores and entire under parts white, washed with rufous buff, most strongly on sides, flanks, and sides of neck; quills below brown, where they rest upon the body pale cinnamon; tail below greyish brown with an obscure broad blackish subterminal band, the outermost feather indistinctly barred (ad. Tadjong piso near Manado, Minahassa, 4. VIII. 93: Nat. Coll. — C 12714). Bill pale, darker above; legs pale. Wing 45, 46 mm; tail 34, 35; tarsus 19, 19.5; bill from nostril 7.5 (2 specimens).

Nestlings (3, apparently belonging to this species). Differ from the adult in having the head like the mantle, raw umber, the middles of the feathers blackish; sides of body browner (S. Celebes: Ribbe & Kühn — C 7085 and 4507—8).

Eggs. Some eggs described in Mr. Nehrkorn's manuscript as those of *C. cursitans* are more likely, we think, to belong to the present species, since *C. cursitans* has never been recorded from North Celebes and not often from the island at all. "Dr. Platen collected a number of eggs in Celebes (Rurukan) which belong to the blue varieties. They have a light blue ground with numerous small liver-brown spots thereon, forming a circlet at the large end. It is to be expected that eggs otherwise coloured also occur there, for no bird displays so many colour-varieties in its eggs as the *Cisticolinae*."

Nest. If the above nestlings are correctly determined as *C. exilis*, two nests in the Dresden Museum should belong to this species. One (S. Celebes: Ribbe & Kühn — Nr. 1598) is almost entirely composed of plant-wool, externally walled with leaves; the other (S. Celebes: R. & K. — Nr. 1599) is similarly walled with leaves and composed of grasses and plant-wool; both of them deep cup-shape.

Distribution. Celebes — Minahassa (Nat. Coll. in Dresden Museum, P. & F. Sarasin *2*); Tawaya, W. Celebes (Doherty *5*); Kandari, S. E. Peninsula (Beccari *b 1*); Macassar (Weber *1*); Palopo, Boni Gulf (P. & F. Sarasin *3*); Luwu (Weber *1*); Togian (Meyer *c 1*); Peling Id. (Nat. Coll. *4*). Dr. Sharpe ascribes to *C. exilis* the following range: "All over Australia, extending northward through many of the Papuan and Moluccan islands to the Philippines and Formosa; also occurring in the Malayan Peninsula and throughout the Burmese countries and Assam, extending into Eastern Bengal."

The first specimens from Celebes obtained by Meyer were originally described by Lord Walden as a distinct species, Philippine specimens being afterwards united by him with them. Dr. Sharpe holds the following opinions on the sexual and seasonal variation of this species: the full-plumaged female is different from the male and has the head striped; in winter the male may ultimately be found to resemble the female; in this season the tail is longer, as in so many winter plumages of *Cisticolae*; in Australia *C. ruficeps* is the adult male, *C. exilis* is the bird in full winter plumage, while *C. isura* is only the square-tailed, summer-plumaged female bird. Whether local differences be finally found to exist or not, ornithologists may be grateful to Dr. Sharpe for uniting a heap of disconnected items as one species, and for pointing out the changes of this bird with age, sex and season. *C. celebensis*, Salvad., a name overlooked

by Sharpe, seems to be identical with *exilis*, and indeed a female or young male, though this question can only be solved with further material.

C. exilis may be distinguished from *C. cursitans* by its smaller size, its having a somewhat narrower cinnamon tip to the tail when seen from below, not rather broad and nearly white, and the subterminal black bar more indistinct. The male is easily recognisable by its golden-tawny head.

Through the kindness of Prof. Reichenow we have been able to examine a specimen of the bird obtained by Meyer in Togian and originally recorded *(c 1)* as *C. cursitans*. We now judge it to be a female of the present species.

GENUS PHYLLERGATES Sharpe.

This genus bears a general resemblance to *Cisticola*, but differs in several important particulars. The tail consists of 10 feathers only; the bill is long, exceeding the length of the cranium, and is slightly notched; the first primary is more than half the length of the second, the second is shorter than, and the third hardly exceeds, the secondaries.

Five species are known between N. W. India and Celebes.

* 214. PHYLLERGATES RIEDELI M. & Wg.

Celebes Tailor-bird.

Plate XXXIV.

Phyllergates riedeli *(1)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 13; *(2)* iid., ib. 1896, Nr. 1, pp. 6, 13; *(3)* Hart., Nov. Zool. 1896, 150; *(4)* id., ib. 1897, 155.

Adult male. Above yellowish olive, brighter on rump and tail-coverts, browner on hind neck and nape; tail and remiges dull brown, edged with the colour of the back, the greater wing-coverts with rather lighter edgings; head above tawny-rufous, a little paler round the eye, browner on cheeks and ear-coverts; chin, throat, breast and middle of abdomen silky white; sides, flanks and under tail-coverts ochraceous yellow; under wing-coverts lighter yellow; thighs dark cinnamon; remiges below dusky, where they rest upon the body whitish: "iris pale umber; feet pale brown, or olive-brown; maxilla blackish, mandible reddish ochraceous" — Doherty *4* (♂, N. side of Takelakadjo Mts., Central Celebes, c. 1000 m, 9. II. 95: P. & F. Sarasin).

Female. The female has the head uniform with the back (Hartert *3*).

Young male. The young male is like the female (Hartert *4*).

Measurements.	Wing	Tail	Tarsus	Bill from nostril
a. (Sarasin Coll.) ♂ ad., Rurukan, 1. VI. 94	48	47	20	10.5
b. (Sarasin Coll.) ♂ ad., Mt. Lokon c. 1100 m . . .	49	48	20.5	10
c. (Sarasin Coll.) ♂ ad., Tomohon, April 1895 . . .	46	51	20	10
d. (Sarasin Coll.) ♂ ad., Tomohon, 22. VI. 94 . . .	48	—	—	9.5
e. (Sarasin Coll.) ♂ ad., Takelakadjo Mts., 9. II. 95 .	49	49	20.5	10
f. (Sarasin Coll.) ♂, Loka, S. Cel., 21. X. 95 . . .	46	47	20	9.5

Distribution. Celebes — Minahassa (P. & F. Sarasin); Takelakadjo Mts., Centr. Celebes (P. & F. S.); Bonthain Mts. (P. & F. S., Everett *3*, Doherty *4*).

The present species forms another interesting addition made by the cousins P. & F. Sarasin to the avifauna of Celebes. Hitherto the genus *Phyllergates* was known by four species, with the following habitats:

P. coronatus (Jerd. & Blyth): the hills of N. W. India and of Tenasserim.

P. sumatranus Salvad. Ann. Mus. Civ. Gen. (2) XII, 1891, 67: Sumatra, ca. 1500 metres (Modigliani).

P. cucullatus (Temm.): Java.

P. cinereicollis Sharpe, Ibis 1888, 479; 1889, 279: Kini Balu Mt. up to 4000 ft. (Whitehead), highlands of North Luzon (Whitehead, fide Grant, Ibis 1894, 510; 1895, 448).

It appears that *Phyllergates* is a hill-haunting genus, for besides the mountain habitats recorded for three of the above species, the Celebesian specimens on record were obtained in the highlands of the island.

The Celebes species is like *P. cinereicollis* of Kini Balu, but differs in having the nape and neck brown, not dark ashy grey, in having no superciliary stripe, and in having the sides of the face and ear-coverts washed with the golden-tawny of the crown. From *P. cucullatus* it differs in wanting the narrow streak of bright yellow over the eye, in the brown colour washed with golden-tawny of the face below the eye, in the dark cinnamon colour, not olive, of the thighs. *P. sumatranus* and *P. coronatus* are more distinct.

Phyllergates is placed by Dr. Sharpe next the genus *Orthotomus*, which has much the same distribution and a similar type of plumage, but the tarsus of *Phyllergates* is without scales in front, except near the lower joint, and Mr. Oates (Fauna Brit. Ind., B. I, 439) points out that the tail consists of only 10 feathers, so that its affinities are evidently with Dr. Sharpe's group of *Cisticolinae* with 10 tail-feathers, *Suya* etc. or with *Abrornis* and *Tickellia*.

Phyllergates is a fresh link between Celebes and the Indian zoological Region, and there is indirect proof that the birds got to Celebes by flight, because, had the genus existed in Celebes since the island was seperated from Asia, greater differences would have been evolved in that great period of time, judging from what seems to have taken place in other species, such as *Rhabdotorrhinus*, etc. This is also shown by the fact that the allied Borneo species stands nearer to the Indian one than does the Celebes species.

The Sarasins furnish the following note on the habits of this bird, observed at a height of about 3000 feet on the mountains of Central Celebes: "After the rain there followed a moonlight night of indescribable clearness. A bird's song resembling that of our Nightingale was to be heard in the dense thicket; probably it came from the little *Phyllergates*-species discovered by us first in the Minahassa and found again here. The thermometer fell to 13°C."

The species was named by Meyer & Wiglesworth in recognition of Dr. Riedel's services in the Zoology and Ethnology of Celebes.

GENUS ACROCEPHALUS Naum.

The larger species, such as that occurring in Celebes, are about equal in size to a Lark. The second primary is very long, reaching nearly to the tip of the wing, the first is very minute. Tail of 12 feathers, strongly rounded. Tarsus anteriorly scutellated with about 6 scales. Bill about as long as the head, with about 3 small subloral bristles, and the tomia notched near the tip.

A northern genus, partial to reed-beds, ditches and corn-fields, of skulking habits, but noisy, migrating to warmer climates in winter.

215. ACROCEPHALUS ORIENTALIS (Temm. Schl.).

Eastern Great Reed-warbler.

a. **[Calamoherpe limnorica** Temm. in Mus. Leyd. fide W. Blas.].

b. **Salicaria turdina orientalis** *(1)* Temm. & Schl., Faun. Jap. Aves 1845—50, 50, t. 21B.

c. **Calamoherpe orientalis** *(1)* Bp., Consp. 1850, I, 285; *(2)* Blak., Ibis 1862, 317; *(3)* Swinh., ib. 1863, 305; *(4)* Tacz., J. f. O. 1874, 319, 334; *(5)* id., ib. 1875, 245; 1876, 194; *(6)* Blak. & Preyer, Ibis 1878, 237.

Acrocephalus orientalis *(1)* Gray, P. Z. S. 1860, 349; *(2)* Wald., Tr. Z. S. 1872, VIII, 64; *(3)* Salvad., Cat. Ucc. Borneo 1874, 251; *(4)* Oates, Str. F. 1875, III, 337; *(5)* Wald., Tr. Z. S. 1875, IX, 195; *(6)* Sharpe, Ibis 1876, 41; *(7)* id., ib. 1877, 16; *(8)* Brooks, t. c. 397; *(9)* Sharpe, P. Z. S. 1879, 338; *(10)* id., Ibis 1879, 255; *(11)* Seeb., Cat. B., V, 1881, 97; *(12)* R. G. W. Rams., Tweedd. Orn. Works 1881, 657; *(13)* A. Müll., J. f. O. 1882, 362, 440; *(14)* Oates, B. Brit. Burmah 1883, I, 93; *(15)* Seeb., Brit. B. I, 1883, 365; *(16)* id., Ibis 1884, 261; *(17)* W. Blas., Ztschr. ges. Orn. 1886, 102; *(18)* Styan, Ibis 1887, 219; *(19)* W. Blas., Ornis 1888, 314; *(20)* id., Ibis 1888, 374; *(21)* Sharpe, Ibis 1889, 266; *(22)* Hartert, J. f. O. 1889, 349; *(23)* Oates, Faun. B. Ind., B., I, 1889, 357; *(24)* Everett, P. Z. S. 1889, 224; *(25)* id., J. Str. Br. R. A. S. 1889, 97; *(26)* Steere, List B. and M. Philipp. Is. 1890, 20; *(27)* Seeb., B. Japan Emp. 1890, 71; *(28)* Whitehead, Ibis 1890, 49; *(29)* Sharpe, t. c. 276; *(30)* Styan, Ibis 1891, 321, 340; *(31)* De La Touche, Ibis 1892, 416; *(32)* Seeb., Ibis 1893, 48; *(33)* Büttik., Zool. Erg. Weber's Reise Ost-Ind. 1893, III, 277; *(34)* Bourns & Worces., B. Menage Exp. 1894, 39; *(35)* Grant, Ibis 1895, 443; *(36)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 13.

d. **Calamodyta orientalis** *(1)* Gray, HL. I, 1869, 207, Nr. 2919; *(2)* Swinh., P. Z. S. 1871, 352; *(3)* id., Ibis 1874, 153, 437; *(3bis)* Salvad., Ann. Mus. Civ. Gen. VII, 1875, 663; *(4)* David & Oust., Ois. Chine 1877, 252; *(5)* Prjev., Rowl. Orn. Misc. II, 1877, 169; *(6)* Bolau, J. f. O. 1880, 115; *(7)* Salvad., Orn. Pap. II, 1880, 425, Agg. 1890, 138; *(8)* Vorderm., N. T. Ned. Ind. 1884, XLIII, 96; *(9)* Deditius, J. f. O. 1886, 538; *(10)* Dörries, J. f. O. 1888, 67.

e. **Calamoherpe turdoides orientalis** *(1)* Tacz., Faune Orn. Sibérie Orient. 1891, 234.

f. **? Acrocephalus australis** *(1)* Wall. (nec Gld.?), P. Z. S. 1863, 25 (Buru); *(2)* Seeb., Cat. B. V, 100, pt. (Lombok).

g. **? Calamodyta australis** pt. *(1)* Salvad., Orn. Pap. II, 1881, 426, Agg. 1890, 138.

For further synonymy cf. Salvadori *d 7*; Seebohm *11*.

Figure and descriptions. Temminck & Schlegel *b I*; Oates *4*, *14*, *23*; David & Oust.

d 4; Seebohm *11*; Salvadori *d 7*; W. Blasius *17*; Vorderman *d 8*; Taczanowski *e 1*.

Adult. Above dark yellowish broccoli-brown, more cinnamon on rump and wing-coverts; quills and tail darker brown, edged with the colour of the rump, tipped with whitish; lores and superciliary stripe buff-white; under-parts buff-white, slightly streaked with brown on the chest, and becoming buff on the sides, flanks and under wing-coverts, and browner on thighs (Minahassa, C 3528).

Iris pale wood-brown; legs lead-grey; bill horn-brown; interior of gape orange (Everett *7*).

Sex. The sexes are similar in plumage.

Young. The young in first plumage differ from the adults in having the upper parts of a more russet tint, the under-parts more strongly washed with isabelline; no trace of dark streaks on the fore-neck[1]); quills and tail edged with russet. Bill yellow-brownish, edged with yellow on both mandibles; feet flesh-colour (Taczanowski *e 1*).

Measurements (2). Wing 87, 92; tail 80, 82; bill from nostril 12, 14; tarsus 29, 31 mm.

Eggs. Usually 5, a little smaller than those of *A. turdoides*; slightly glossy; often perfectly elliptical; ground-colour delicate blue or pale dirty greenish, with underlying spots of ashy grey or olivaceous grey, and superjacent ones of olive-brownish mingled with others nearly black — the spots being irregular in shape and size, but usually evenly distributed over the egg (Argona River, E. Siberia — Tacz. *e 1*).

Nest. Not differing from that of the European Great Reed-warbler in construction, in materials and dimensions (Godlewski *e 1*).

Distribution. Mongolia (Prjevalsky *d 5*, *d 9*); E. Siberia — Ussuriland, S. Dauria and Amurland (Dybowski and Godlewski *c 4*, *c 5*, *e 1*, Prjevalsky *d 5*), Askold Id. (Dörries *d 6*, *d 10*); Japan (Blakiston, etc. *c 2*, *27*); China (Swinhoe, etc. *c 3*, *d 4*, *18*, *30*, *31*); Pegu (Oates *4*, *14*, *23*); Andamans (Wimberley *11*, *14*, *23*); Tenasserim (Davison *14*, *23*); Malay Peninsula — Salanga Id. (J. Weber *13*); Sumatra (Hartert *22*, Leyden Mus. *d 7*); Java (Vorderman *d 8*, v. Schierbr. in Dresd. Mus.); Lombok (Wallace *11*, *d 7*); Borneo (Everett, etc. *6*, *7*, *21*, *25*); Philippines — Palawan (Platen *19*, *20*, *28*), Luzon (Meyer *5*, Whitehead *35*), Cebu (Meyer *5*, Steere *26*), Mindanao (Steere *26*), Mindoro (B. & W. *34*); Celebes — North (Bruijn *d 3bis*, Riedel *17*, Faber in Dresd. Mus., P. & F. Sarasin *36*), — South: Tempe (Weber *33*); ?Ternate (Rosenberg *d 7*); Batchian and Morty (Wallace *d 7*).

This species, commonly spoken of as the Eastern representative of the Great Reed-warbler, *A. turdoides*, differs from the European bird by its legs and feet being lead-colour, instead of pale horn, by its somewhat smaller size and proportionally larger bill; and according to Prof. W. Blasius the diminutive first quill is less reduced. In Pegu the Indian Great Reed-warbler, *Acrocephalus stentorius* (Hemp. & Ehr.), occurs with the present species in winter, and Oates considers that they can only be discriminated when the wings are fully grown and perfect: in *stentorius* the second quill is equal to or shorter than the fifth, in *orientalis* it is usually equal to the fourth and hardly shorter than the third, which is longest.

A. orientalis is known to ornithologists in Eastern Asia as a migrant, breeding in East Siberia, China and Japan, and departing south for the winter.

[1]) Seebohm *(11)* holds this to be a character of the first plumage.

Prjevalsky and Godlewski say it arrives in May in Amurland, where its song can be heard till the end of summer; it breeds in June and July and disappears in September. Similarly in the neighbourhood of Pekin it arrives in great numbers about May, nests among the reeds in the marshes and leaves in September (David *d 4*). Blakiston and Pryer *(c 6)* record its arrival at Tokio, Japan, at the end of April; Seebohm records *(32)* a specimen captured at Sea 40 miles north of one of the Loochoo Islands on May 24th. In Central China, the lower Yangtse Basin, Mr. Styan *(30)* remarks that "thousands arrive towards the end of April to breed in the reed-beds of the Yangtse, and remain till the end of October or middle of November". Further south in China Mr De La Touche *(31)* found it very abundant in summer. Its chief winter-quarters seem to be Burmah and Borneo, and much may ultimately be learnt of its winter movements in the less-known Siamese Peninsula. Mr. E. W. Oates *(4)* writes that in Pegu "it arrives in great numbers about the 15th November and stays in undiminished quantities till the 31st May at the least. On its first arrival it affects bamboo bushes, thick clumps of grass, and patches of weeds; but as the season progresses, and the Peepul trees come out into leaf, its haunts become chiefly arboreal" — a singular departure from the ordinary habits of a Reed-warbler, as Mr. Oates rightly points out. In the East India Islands, with the exception of Borneo where a good number of specimens have been obtained during the northern winter, few examples have as yet been found, perhaps because it is really rare here and must be regarded as a straggler, or perhaps also because its plain plumage and skulking habits lead to its being disregarded or overlooked by collectors. Only five of the Philippines have so far furnished specimens, Meyer got it in Luzon in February, in Cebu in March, Whitehead in Luzon in November, Steere in Cebu in January and in Mindanao in October, while a specimen of Platen's from Palawan in the Dresden Museum is dated December[1]). In Java Dr. Vorderman *(d 8)* writes that he has only received a couple of specimens, killed in the rainy season (Oct.—April).

From Celebes itself the following only have been recorded: one or more in the Tweeddale Collection *(2)* from Manado, one in the Brunswick *(17)* and one in the St. Petersburg Museum *(17)*, one killed by Prof. Weber at Tempe *(33)*, two in the Dresden Museum, one sent by Bruijn's hunters from Manado to Count Salvadori with the date July *(d 3bis)*, 3 obtained by the Sarasins at Tondano in November, 1894, and one at Tomohon, 15th May, 1894. Although the date July may be correct, as that of an individual left behind in the general migration, the facts before us render it pretty certain that *A. orientalis* is only a winter visitant to Celebes and the neighbouring islands.

Its other habits are said to correspond with those of the Great Reed-warbler of Europe (Prejevalsky *d 5*, Godlewski *e 1*).

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1) W. Blasius has spoken of this collection as having been formed in summer (Ornis 1888, 302)!

GENUS LOCUSTELLA Kaup.

Very similar to *Acrocephalus*, but having the tail much more strongly graduated, the outermost rectrix falling short of the middle ones by more than $^1/_4$ of the tail-length, the tail-coverts almost equally long; the rictal bristles very small and inconspicuous. Two species of this northern genus are known as winter visitors to the Celebesian area.

216. LOCUSTELLA FASCIOLATA (G. R. Gray).

Gray's Grasshopper-warbler.

a. **Acrocephalus fasciolatus** *(1)* Gray, P. Z. S. 1860, 349; *(2)* Seeb., P. Z. S. 1877, 806; *(3)* Tweedd., P. Z. S. 1878, 430.

b. **Acrocephalus insularis** *(1)* Wall., Ibis 1862, 350; *(2)* Salvad., Ann. Mus. Civ. Gen. IX, 1876, 59.

Locustella fasciolata *(1)* Blyth, Ibis 1867, 21; *(2)* Seeb., Ibis 1878, 490; *(3)* id., Ibis 1879, 15; *(IV)* id., Cat. B., V, 1881, 109, pl. V; *(5)* Salvad., Orn. Pap. II, 1881, 426; *(6)* Wardl. Rams., Tweedd. Orn. Works 1881, 657; *(7)* Pleske, Bull. Ac. Sc. Petersb. 1884, 127; *(8)* Meyer, Isis, Dresden 1884, 6; *(9)* Tacz., Bull. Soc. Zool. Fr. 1885, 467; *(10)* Nikolski, Ile de Sakhal. et sa faune 1889, 179; *(11)* W. Blas., Ornis 1888, 605; *(12)* Tristr., Cat. Coll. B. 1889, 152; *(13)* Steere, List B. & M. Philipp. Is. 1890, 20; *(14)* Salvad., Orn. Pap. Agg. 1890, 138; *(15)* Seeb., B. Japan Emp. 1890, 72; *(16)* Tacz., Faune Orn. Sibérie Orient. 1891, 249; *(16bis)* Pleske, Vög. Russ. Reichs II, 564 (1891); *(17)* M. & Wg., J. f. O. 1894, 246; *(18)* Grant, Ibis 1894, 408; *(19)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 9, p. 6.

c. **Calamodyta fasciolata** *(1)* Gray, HL. I, 1869, 207, Nr. 2924; *(2)* Swinh., P. Z. S. 1871, 352; *(3)* David & Oust., Ois. Chine 1877, 253.

d. **Calamodyta insularis** *(1)* Gray, HL. I, 1869, 207, Nr. 2925; *(2)* Swinh., P. Z. S. 1871, 352; *(3)* id., Ibis 1874, 437; *(4)* id., Ibis 1876, 332; *(5)* David & Oust., Ois. Chine 1877, 253; *(6)* Seeb., Ibis 1879, 35; *(7)* De La Touche, Ibis 1892, 411.

e. **Arundinax fasciolatus** *(1)* Swinh., Ibis 1876, 332.

"Putiareoloa" or **"Tikarelo"**, Talaut, Nat. Coll. *17.*

For further synonymy and references cf. Seebohm *a 2, 3, IV*; Salvadori *5.*

Figure and descriptions. Seebohm *IV*; Gray *a 1* (= juv.); Wallace *b 1* (= ad.); David & Oustalet *c 3* (= juv.), *d 5* (= ad.); Salvadori *5*; Taczanowski *16.*

Adult. Above bistre-brown, more rufous-brown on the rump, tail and outer edges of the wing-coverts and quills; from the lores to above the ear-coverts a pale superciliary stripe; ear-coverts with whitish shaft-streaks; under-parts white, strongly tinged with drab on the fore-neck and chest, with more olivaceous brown on the sides and flanks, becoming on flanks under tail- and wing-coverts isabelline (Talaut, Oct. 1896 — C 15398).

Rim round eye yellowish; upper mandible blackish brown, edge yellowish, lower mandible chrome-yellow at base, tip brownish; mouth chrome-yellow (Swinhoe *d 3*).

Sex. Differences of coloration are not known to exist. Seebohm examined two females in which "the pale ash-grey of the chin, throat, and breast was replaced on the chin and upper throat by pale brownish white, shading into brown on the lower throat, which became more ochraceous on the breast".

Young. The under-parts suffused with buff, the tips of the feathers on the throat wood-brown, creating a barred appearance; the breast also barred, but more uniform wood-brown; sides and flanks uniform yellow-brown (Salibabu, Talaut, 29. Oct. 1893: Nat. Coll. — C 13134).

Measurements. Wing c. 80—85 mm; tail 68—72; tarsus 26—28; bill from nostril 10.5—12.

Nest and eggs unknown.

Distribution. East Siberia from Yeneseisk (Godlewski *16*) and Irkutsk to the shores of the Sea of Japan (Dybowski and Godlewski *16*); Japan (Blakiston *d 4, d 6, 15*); China (Swinhoe *c 2, d 2, 12*, David *c 3, d 5*); Philippines — Luzon (Othberg *a 3*, Whitehead *18*), Marinduque (Steere *13*); Talaut — Salibabu and Karkellang (Nat. Coll. *17*); Great Sangi (Bruijn *b 2, 11*); Morty (Wallace *b 1, IV*); Halmahera (Wallace *IV*, Bruijn *5*); Ternate (Beccari *5*, Fischer 7); Tidore (Bruijn *5*); Kaioa (Wallace *IV, 5*); Batchian (Wallace *IV*); Amboina (Beccari *5*).

This Grasshopper-warbler is very imperfectly known. Its summer haunts are Siberia and, apparently, rather high latitudes there; in winter it has been found in the East Indies which are washed by, or are not far from, the Pacific, but not in the Great or Lesser Sunda Islands; the Pacific coast-line guiding, as it might seem, the birds in their migration. In this respect it corresponds with *Muscicapa griseosticta*. Swinhoe *(d 2)* observes that the bird comes to Amoy in May in great numbers, and disappears again almost immediately; Blakiston met with it at Hakodadi, but "it passes north to breed". Its nest and eggs have not yet been discovered. Seebohm *(15)* says it "breeds near Lake Baikal and in the valley of the Amoor", but does not tell us on what authority he makes this statement; Taczanowski *(16)* writes that Dybowski and Godlewski found it in these regions — the neighbourhood of Irkutsk, Dauria, Ussuriland and the coast of the Sea of Japan — but everywhere very rare and apparently only on migration. Godlewski heard it, however, during his return-journey across the Government of Yeneseisk at the end of July.

In the East Indies all the specimens we have seen recorded in which the date of acquisition is noted *(14)* were killed between September and the end of May. There are two adults and one young one from Talaut in the Dresden Museum, a fourth is at Tring, all killed in October and November.

The genus *Locustella* is distinguishable from *Acrocephalus* by its strongly graduated tail, the outside feather being less than three-quarters of the length of the longest. Seebohm has pointed out that the present species like some other *Locustellae* in its first plumage is strongly tinged with yellow, and that the form described by Mr. Wallace as *insularis* is the adult of the yellower bird described by G. R. Gray two years earlier as *Acrocephalus fasciolatus*. Its habits are described by Godlewski in W. Taczanowski's "Faune Ornithologique de la Sibérie Orientale" *(16)*.

Locustella ochotensis (Midd.) may be distinguished from the present species by its smaller size and the dark centres to the feathers of the upper surface; the northern range of the two species is somewhat similar, and both are now known from the Celebes area.

217. LOCUSTELLA OCHOTENSIS (Midd.).

Middendorff's Grasshopper-warbler.

a. **Sylvia (Locustella) ochotensis** *(1)* Midd., Sib. Reise 1853, II (2), 185, t. XVI, f. 7, 8.

b. **Calamodyta ochotensis** *(1)* Gray, HL. 1869, I, 210, Nr. 2973; *(2)* Tacz., P. Z. S. 1889, 621; *(3)* id., Faune Orn. Sib. Orient. 1891, 241.

Locustella ochotensis *(1)* Cab., J. f. O. 1871, 151; *(2)* Dresser, B. Eur. II, 634 (1878); *(3)* Sharpe, P. Z. S. 1879, 338; *(4)* Seeb., Cat. B., V, 1881, 113; *(5)* Styan, Ibis 1887, 220; *(6)* Sharpe, Ibis 1889, 265; *(7)* Everett, J. Str. Br. R. A. S. 1889, 97; *(8)* Steere, List B. & M. Philipp. Is. 1890, 20; *(9)* Sharpe, Ibis 1890, 276; *(10)* Seeb., B. Japan. Emp. 1890, 73; *(11)* Styan, Ibis 1891, 318; *(12)* Pleske, Vög. Russ. Reichs II, 590 (1891); *(13)* De La Touche, Ibis 1892, 417; *(14)* Grant, Ibis 1896, 465.

c. **Locustella subcerthiola** *(1)* Swinh., Ibis 1874, 154; *(2)* David & Oust., Ois. Chine 1877, 249.

d. **Arundinax blakistoni** *(1)* Swinh., Ibis 1876, 332, pl. VIII, f. 1.

For further synonymy and references cf. Taczanowski *b 3*.

Figures and descriptions. Middendorff *a I* (= juv.); Swinhoe *d I* (= juv.), *c 1*; David & Oust. *c 2*; Seebohm *4*[1]); Taczanowski *b 3*.

Adult. Above bistre-brown, with darker centres to the feathers; rump and upper tail-coverts uniform and brighter; crown and nape greyer brown, with blackish centres to the feathers; wing-coverts and quills dark brown edged with the colour of the back, but paler; tail darker and purer brown than the back, with obsolete bars showing in certain lights, tip whitish, preceded by two or three blackish bars seen more plainly from below; superciliary stripe from lores to above ear-coverts yellowish white; in front of and below the eye brown like the head; chin, throat and middle of abdomen white, the feathers on the throat more or less tipped with wood-brown; breast and sides dark rufous wood-brown; crissum and under tail-coverts wood-brown; under wing-coverts yellowish white. Wing 66 mm; tail 52; tarsus 23; bill from nostril 9.5 (Minahassa: Faber — C 3518).

Upper bill brownish horn, lower flesh-whitish; feet pale yellowish with pale claws; iris deep brown (Tacz. *b 3*).

Sex and Young. Sexual differences of coloration are not known to exist. Other specimens, probably younger, are suffused with yellowish (Tacz. *b 3*).

Eggs. 5—6, rose-colour, moderately glossy, with a few fine veins encircling the large end, no other markings: size 21 × 14.3 mm (Kamtschatka — ex Tacz. *b 3*). Taczanowski remarks that the eggs resemble those of *Arundinax aedon* (Pall.).

Distribution. Kamtschatka (Dybows. *b 3*); Bering Id. (Stejneger *b 3*); Kurile Is. (Wossnes. *4*); Japan (Blak. *10*); China (David *c 2*, De La Touche *13*); Philippines — Marinduque (Steere *8*), Mindoro (Whitehead *14*); North Borneo (Low *3*, *7*, Whitehead *6*, *7*); Celebes — Minahassa (Faber in Dresden Mus.).

A single specimen, which we find to belong to this species, is in the Dresden Museum; it is new to the island. The species stands very near to *L. certhiola* (Pall.), in which the centres to the feathers on the back are black, producing a more spotted appearance; this bird has been recorded from some of the same localities, and it appears to us desirable that a fresh comparison

[1]) From Seebohm's description we are by no means convinced that the specimens in the British Museum belong to this species, but think they may be *Locustella pleskei* (Tacz., P. Z. S. 1889, 621).

of the two forms should be made before their distinction as species is admitted. Cabanis *(1)* held them to be identical. Taczanowski *(b 2)* has recently separated a third form, *L. pleskei* from Corea, which is said to differ from *L. ochotensis* in being larger, having a much longer bill, a longer tail, and the feathers of the back and head uniform without a trace of a darker centre. What this bird is we do not know, but it is of course a migrant occurring in southern localities in winter.

GENUS PHYLLOSCOPUS Boie.

The Willow-warblers are generally smaller than the Reed-warblers, have the tail of 12 feathers square, the tarsus not scutellated, the feathers of the forehead at the base of the bill, as is shown by Oates, disintegrated and velvety, with a few hairs directed forwards. The bill is slightly notched, somewhat weaker and flatter than in *Acrocephalus*, the culmen about as long as the cranium. The first primary is minute, the second very long, the third and fourth longest. The nest is domed, placed on or near the ground; the eggs white, prettily spotted.

A Palaearctic genus, migrating south in winter.

218. PHYLLOSCOPUS BOREALIS (Blas.).

Arctic Willow-warbler.

a. **Phyllopneuste javanica** *(1)* Bp. (nec Horsf.), Consp. 1850, I, 290; *(2)* Salvad., Cat. Ucc. Borneo 1874, 244.

b. **Sylvia (Phyllopneuste) eversmanni** *(I)* Midd. (nec Bp.), Sib. Reise, Vög. 1853, 178, t. XVI, f. 1, 2, 3 A.

c. **Phyllopneuste borealis** *(1)* J. H. Blas., Naumannia 1858, 313; *(II)* id., in Naum. Vög. Deutschl. XIII, 69, t. 375, f. 1; *(3)* id., Ibis 1859, 459; 1862, 68—70; *(4)* Swinh., P. Z. S. 1871, 356; *(5)* Tristr., Ibis 1871, 231; *(6)* Tacz., J. f. O. 1872, 358; *(7)* id., ib. 1874, 328, 335; *(8)* Wald., Ibis 1874, 140; *(9)* Swinh., t. c. 440; *(10)* Brooks, t. c. 459; *(11)* Tacz., J. f. O. 1875, 245; *(12)* Meves, t. c. 429; *(13)* David & Oust., Ois. Chine 1877, 271; *(14)* Pryer, Rowley's Orn. Misc. 1877, II, 171; *(15)* Tacz., P. Z. S. 1887, 602; *(16)* id., ib. 1888, 463; *(17)* id., Faune Orn. Sib. Orient. 1891, I, 254.

d. **Phylloscopus sylvicultrix** *(1)* Swinh., Ibis 1860, 53.

e. **Sylvia flavescens** *(1)* Gray, P. Z. S. 1860, 349.

f. **Phyllopneuste kennicotti** *(I)* Baird, Tr. Chicago Ac. Sc. I, 1869, 313, pl. 30, f. 2.

Phylloscopus borealis *(1)* Cordeaux, Ibis 1875, 179; *(2)* Seeb. & H. Brown, Ibis 1876, 216; *(3)* Collett, P. Z. S. 1877, 43—47; *(4)* Wald., t. c. 697, 762; *(5)* id., ib. 1878, 342, 950; *(6)* Hume & Davis., Str. F. 1878, VI, 353; *(VII)* Dresser, B. Eur. II, 510, pl. 79 (1878); *(8)* Wardl. Rams., P. Z. S. 1880, 14; *(9)* Salvad., Orn. Pap. II, 1881, 428; *(10)* Seeb., Cat. B., V, 1881, 40; *(11)* id., Ibis 1882, 375; *(12)* Severtz., Ibis 1883, 66; *(13)* Oates, B. Brit. Burmah 1883, I, 77; *(14)* Meyer, Isis, Dresden 1884, 47; *(15)* Pleske, Bull. Ac. Sc. Petersb. 1884, 129; *(16)* Matschie & Ziemer,

J. f. O. 1885, 181; *(17)* Collett, Ibis 1886, 217—223; *(17bis)* Meves, Ornis 1886. 223; *(18)* Styan, Ibis 1887, 219; *(19)* Sharpe, Ibis 1888, 201; *(20)* W. Blas., Ornis 1888, 314, 605; *(21)* Everett, J. Str. Br. R. A. S. 1889, 96; *(22)* Steere, List B. & M. Philipp. Is. 1890, 20; *(23)* Salvad., Orn. Pap. Agg. 1890, 138; *(24)* Whitehead, Ibis 1890, 51; *(25)* Seeb., B. Japan. Emp. 1890, 69; *(26)* Salvad., Ann. Mus. Civ. Gen. 1891, 68; *(27)* Styan, Ibis 1891, 321, 339; *(28)* Seeb., Ibis 1892, 10; *(29)* De La Touche, t. c. 415; *(30)* Oust., N. Arch. du Mus. 1893, 176; *(31)* Büttik., Zool. Erg. Weber's Reise Ost-Ind. 1893, 293; *(32)* Grant, Ibis 1894, 408; *(33)* M. & Wg., J. f. O. 1894, 246; *(34)* Bourns & Worces., B. Menage Exp. 1894, 39; *(35)* Hart., Nov. Zool. 1894, 469; *(36)* id., ib. 1895, 466; *(37)* Everett, Ibis 1895, 23; *(38)* Grant, t. c. 443; *(39)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 13; *(40)* Hart., Nov. Zool. 1896, 150, 167, 544, 566, 581; *(41)* Büttik., Notes Leyden Mus. 1896, XVIII, 182.

g. **Phyllopseustes borealis** *(1)* Meves, J. f. O. 1875, 429; *(2)* Ridgw., Man. N. Am. B. 1887, 567; *(3)* Nelson, Report N. H. Coll. in Alaska 1887.

h. **Acanthopneuste borealis** *(1)* Oates, Faun. Br. Ind., B. 1889, I, 412; *(2)* Pleske, Vög. Russ. Reichs II, 156 (1889).

"Puti arelo", Talaut, Nat. Coll.

For further synonymy and references cf. Salvadori *9*; Seebohm *10*; Taczanowski *c 17*; Oates *h 1*.

Figures and descriptions. Dresser *VII*; Middendorff *b I*; J. H. Blasius *c II*; Baird *f I*; David & Oustalet *c 13*; Taczanowski *c 17*; Salvadori *9*; Seebohm *10*; Oates *13*, *h 1*; Ridgway *g 2*.

Adult [winter]. Above olivaceous green, the greater wing-coverts tipped with yellowish white, forming a bar; superciliary stripe from nostril to above ear-coverts buffy; ear-coverts and lores mixed with dusky; under-parts white, slightly washed with yellow on throat, abdomen and under tail-coverts, with drab on sides of breast and sides, becoming more olive-green on flanks; under wing-coverts pale yellow (Great Sangi: Meyer — C 3654).

"Upper mandible dark brown, the edges and tip yellow; gape and basal half of the lower mandible orange-yellow, terminal half dusky; mouth bright orange-yellow; iris dark brown; legs flesh-colour, tinged with yellow; claws yellowish horn-colour (Oates *h 1*).

Female. Rather smaller than the male (Collett *3*, *17*).

Measurements (9 examples, Talaut, Sangi, and Celebes). Wing 63—68 mm; tail c. 40—46; tarsus c. 18.5; bill from nostril c. 7.5. A ♂ from Kalao Id. (Everett) is much larger: wing 73 mm; not so, however, a ♀: wing 65.

Eggs. 5—7. Pure white, profusely spotted with very small and very pale pink spots (Yenesei — Seebohm *VII*).

Nest. Semi-domed, the outside composed of moss, the inside of fine dry grass, built on the ground on the side of a tussock of grass and the like (Seeb. *VII*).

Distribution. Heligoland (Gätke *c 1*, *c II*, *c 3*, *28*); Norway (Collett *3*, *VII*, *17*); North Russia (Meves *g 1*, Seebohm & H. Brown *2*, Henke *11*); Siberia — Obi valley (Finsch *c 11*); Yenesei valley (Seebohm *VII*, *c 17*); Lena (Bunge *c 17*); Kamtschatka (Dybowski *c 17*); Baikal, Dauria etc. (Godlewski *c 17*); Mongolia (Prjevalsky *c 14*); Tibet (Bonvalot & D'Orleans *30*); Alaska (Nelson *g 2*, *g 3*); Kurile Is. (Schrenck *VII*, Wossnes. *25*); Commodore Is. (Stejneger *c 17*); Corea (Kalinowski *c 15*, *c 16*); Japan (Blakiston & Pryer *25*); China (Swinhoe *c 4*, David *c 13*, Styan *27*, etc.); Formosa (Swinhoe *c 4*); Manipur (Hume *h 1*); Burmah (Oates *13*, *h 1*);

Andamans (Wardl. Ramsay *c 8*); Tenasserim (Davison *6*, *h 1*); Cochin China (Tiraud *13*); Malacca (Maingay *VII*, *9*); Natuna Is. (Everett *35*, Hose *36*); Sumatra (Bock *8*, Modigliani *26*); Nias (Kannegieter *41*); Philippines (Everett *4*, *5*, Steere *22*, Platen *20*, Whitehead *24*, Bourns & Worcester *34*); Borneo (Doria & Beccari *a 2*, etc. *21*); Talaut — Kabruang and Karkellang (Nat. Coll. *33*); Great Sangi (Meyer *14*, *20*); Celebes (Meyer in Dresd. Mus.) — Minahassa (Sarasin Coll. *39*), Mount Bonthain (Everett *40*); Saleyer and Kalao (Everett *40*); Morty (Wallace *10*); Halmahera (Wallace *10*); Ternate (Wallace, Beccari *9*, *10*, Fischer *15*); Batchian (Wallace *9*, *10*); Buru (Bruijn *9*); Amboina (Beccari *9*); Flores (Wallace *9*, *10*, Weber *31*); Timor (Wallace *9*, *10*); Bali, Sumbawa and Sumba (Doherty *40*).

The breeding-grounds of the Arctic Willow-warbler are in Siberia, where its nest has been found by Seebohm and by Dybowski and Godlewski, and in 1876 it was discovered nesting also in northern Norway by Prof. Collett. As it has been met with in summer in a number of localities between Norway and Alaska, it would seem likely that it breeds in all suitable spots between these widely separated countries. During the periods of migration its numbers increase, as Godlewski says in Taczanowski's work *(c 17)*, in S.E. Siberia — Baikal and Dauria — to such an extent that the bird is to be found in nearly every bush. Further south in Corea Kalinowski found it common only on migration in spring and autumn and rare in summer; somewhat the same condition seems to obtain in North China, though the Abbé David remarks that a large number remain to breed; in Central and South China Swinhoe *(c 4)*, Styan *(27)* and De La Touche *(29)* met with it, however, only during its spring and autumn transit between its summer and winter quarters; at these times it passes through the country in abundance. It arrives in Southern Pegu and Tenasserim, as Mr. Oates observes *(h 1, 13)*, about the middle of September, and winters there. Its date of arrival in Palawan is given by Mr. Whitehead *(24)* as about September 16th, and the dates of specimens killed in the East India Islands prove that it is present here between September and May. In the autumn of 1896 no fewer than 25 examples were collected by our hunters in the largest island of the Talaut Group, Karkellang.

For its size the Arctic Willow-warbler is certainly one of the most remarkable of migrants, its weight being less than 15 gr., and its migration in some cases passing over 5000 miles. What becomes of the birds which nest in Norway and North Russia is not known, for, except that a single specimen has been killed and a second seen in Heligoland (Gätke, Vogelwarte 1891, 308), it has never been met with in Central or Southern Europe, and Menzbier expresses the opinion (Zugstr. d. Vög. im eur. Russland 1886, 47; Tacz. *c 17*) that the migration takes place from west to east and east to west, till the European birds join the Asiatic ones at the Ural mountains.

The nearest allies of *P. borealis* seem to be *P. xanthodryas* Swinh., occurring with it in China and Japan and known to occur in winter in Borneo, and

P. pseudoborealis Severtz. The former is distinguishable by its larger size and first primary of 13—15 mm long (in *P. borealis* only 7—11 mm), the latter also by its longer first primary (about 15 mm) and the second quill equal to the seventh, not the sixth *(12)*.

The habits of *P. borealis* are described by Prof. Collett *(3, VII, 17)* and by Godlewski (Tacz. *c 17*).

GENUS CRYPTOLOPHA Sw.

An African and Oriental genus of stationary species, much like *Phylloscopus* in general appearance, but differing greatly by its short, rounded wing. First primary about $^1/_2$ the length of the second, which is about equal to the secondaries; tip of wing formed by the 4th—6th. A few scutellations to be made out on the tarsus. Nest domed; eggs white.

* 219. CRYPTOLOPHA SARASINORUM M. & Wg.

The Sarasins' Warbler.

Plate XIX.

Cryptolopha sarasinorum *(1)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 9; *(2)* Hartert, Nov. Zool. 1896, 158.

Adult male. Above greenish olive, with a yellower tone on the rump, upper tail-coverts and edges of remiges and tail-feathers, as also of the wing-coverts; the tips of the greater series lighter; head above browner, with an olive-yellow mesial stripe; a broad superciliary stripe extending to over the ear-coverts paler, whitish over the lores; lores and behind the eye dusky; under surface whitish, washed with yellow, most strongly on middle of breast; sides of breast and of body olivaceous; under tail-coverts and metacarpal edge pale yellow; under wing-coverts nearly white; remiges below dusky, where the inner edges rest upon the body whitish; rectrices below dusky, the two outermost pairs white on the inner web, less pure on the second pair: "iris dark brown; bill sepia-brown, mandible ochreous, tinged with sepia; legs lead-blue; claws light brown" — Everett *2* (♂, type, Loka, S. Cel., 19. X. 95: P. & F. Sarasin).

Sexes. The sexes do not seem to differ in coloration.

Measurements (5 examples). Wing 52—58 mm; tail c. 39—43; tarsus 20—21; bill from nostril 6—6.5.

Distribution. South Celebes — Mount Bonthain and the hills abutting thereon (P. & F. Sarasin *1*, Everett *2*).

This species was found by the Drs. Sarasin and Mr. Everett in October, 1895, on the Bonthain mass of mountains at altitudes ranging from 2300 to about 8000 feet. Dr. Sharpe, who places *Cryptolopha* among the *Muscicapidae*, recognised 16 species in 1879, and the present bird is the seventh new species added since, the other six being: *C. schwaneri* and *C. montis* Sharpe from Kini Balu (Ibis 1887, 442; 1889, pl. VIII), *C. davisoni* Sharpe from Perak (P. Z. S.

1888, 271), *C. nigrorum* Moseley from the Philippines (Ibis 1891, 47, pl. II; 1894, 506), *C. vordermani* Büttik. from East Java (Notes Leyden Mus. 1893, XV, 260), and *C. flavigularis* B'ourns & Worc., from Cebu (Minnesota Ac. N. Sc. 1894 I, 1, 23). The genus is found in Africa and the Oriental Region as far as Celebes. The South Celebes species seems to be most nearly related to *C. trivirgata* (Strickl.) of Java, Bali and Lombok; the latter has not got the two white lateral rectrices, is chiefly ochraceous yellow below, and has the lateral stripes on the head blackish. Black side-stripes on the head and a bright yellow belly should serve to distinguish the Indian *C. burki* (Burton) which has the two lateral rectrices white for the greater part.

The Indian species build domed, globular nests and lay white eggs. Mr. Oates remarks that they are not known to have any song.

FAMILY MOTACILLIDAE.

The Wagtails and Pipits form a well characterized group of small birds. They seek their food on the ground, or in shallow water, or spring up on the wing to catch it in the air; they never hop on the ground, but walk or run; they avoid the forest and dense underwood, and are to be looked for in more open situations, or on the plain or the strand. They are best distinguished by the wing of nine primaries, with the innermost secondaries or "tertiaries" much longer than the ordinary secondaries, so forming a forked wing; tarsus long, bare, scutellate in front, with an entire lamina behind; the hind claw in the terrestrial species very long; bill as long as head or less, slender, straight, scarcely notched, with very small and inconspicuous rictal bristles.

GENUS MOTACILLA L.

The Wagtails differ from the Pipits by having their upper plumage uniform, not streaked or mottled, and black or blackish legs. They are noisy, active birds, more or less sociable, migratory. They run very much on the ground, often moving the tail up and down — whence the name. An Old World family, known also from the North-west of N. America.

220. MOTACILLA FLAVA L.

Blue-headed Wagtail.

Motacilla flava *(1)* Linn., S. N. 1760, I, 331; *(II)* Naum., Vög. Deutschl. III, 839, t. 88 (1823); *(3)* Meyen, Act. Ac. Caes. Leopold. 1834, XVI, 80; *(4)* id., Reise um d. Erde 1835, II, 195; *(V)* Gould, B. Eur. 1837, II, pl. 145; *(VI)* Keulemans, Onze Vog. 1869, I, pl. 26; *(7)* Finsch & Conrad, Verh. z.-b. Ges. Wien 1872, (2); *(VIII)* Dresser, B. Eur. 1875, III, 261, pl. 129, f. 1, 2; *(9)* Brügg., Abh. Ver. Bremen 1876, V, 67; *(10)* Rosenb., Malay. Archip. 1878, 272; *(XI)* Sharpe, Cat. B. X,

1885, 516, pl. II, ff. 3, 4, 5; *(12)* Dresser, Ibis 1889, 88; *(13)* Lilford, t. c. 322; *(14)* Sharpe, t. c. 431; *(15)* Everett, J. Str. Br. R. A. S. 1889, 102; *(16)* Whitehd., Ibis 1890, 52; *(17)* Steere, List B. & M. Philipp. Is 1890, 21; *(18)* Seeb., B. Japan. Emp. 1890, 115; *(19)* Oates, Faun. Br. Ind. B. II, 1890, 295; *(20)* Styan, Ibis 1891, 343; *(21)* De La Touche, Ibis 1892, 408, 419; *(22)* Hart., Nov. Zool. 1894, 475; *(23)* Bourns & Worces., B. Menage Exp. 1894, 37; *(24)* Everett, Ibis 1895, 23, 33; *(25)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 13; *(26)* iid., ib. 1896, Nr. 2, p. 18; *(27)* Hart., Nov. Zool. 1896, 154, 168, 546.

a. **Budytes flavus** (or **flava**) *(1)* Gould, B. Gr. Brit. III, pl. 4 (ca. 1870); *(2)* David & Oust., Ois. Chine 1877, 302; *(3)* Oates, B. Br. Burmah 1883, 162; *(4)* Radde & Walter, Ornis 1889, 42, 214, 245; *(5)* Salvad., Agg. Orn. Pap. 1890, 128; *(6)* id., Ann. Mus. Civ. Gen. 1891 (2) XII, 69; *(7)* Tacz., Faune Orn. Sib. Orient. 1891, 379; *(8)* Hartert, Kat. V. Senckenb. Mus. 1891, 42, 43; *(9)* Meyer & Helm, Verz. d. Vög. Sachsens 1892, 100.

b. **Budytes viridis** *(1)* Wald., Tr. Z. S. 1872, VIII, 65; *(2)* Meyer, J. f. O. 1873, 405; *(3)* Wald., Tr. Z. S. 1875, IX, 196; *(4)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 666; *(5)* Tweedd., Ibis 1877, 310; *(6)* id., P. Z. S. 1877, 697; *(7)* id., P. Z. S. 1878, 710, 950; *(8)* Meyer, Ibis 1879, 127; *(9)* Wardl. Rams., Tweedd. Orn. Works 1881, 658; *(10)* Salvad., Orn. Pap. II, 1881, 430; *(11)* Vorderman, N. T. Ned. Ind. 1883, XLII, 221; *(12)* W. Blas., J. f. O. 1883, 155; *(13)* M. & Wg., J. f. O. 1894, 247.

c. **Motacilla borealis** *(1)* Büttik. (nec Sundev.), Zool. Erg. Weber's Reise Ost-Ind. 1893, III, 277.

"Tunonsi sua", Tonkean, E. Celebes, Nat. Coll.

"Acobatanga", Talaut, Nat. Coll. *b 13.*

For further synonymy and references cf. Sharpe *XI.*

Figures and descriptions. Naumann *II*; Gould *V*, *a 1*; Keulemans *VI*; Dresser *VIII*; Sharpe *XI*; Oates *a 3*, *19*; David & Oustalet *a 2*; Salvadori *b 10*; Vorderman *b 11.*

Adult male (summer). Head and neck slate-grey; a broad superciliary stripe from nostril to above ear-coverts white; lores black; ear-coverts blackish slate with some of the feathers partially white; upper surface olive-green, yellower green on the lower back and rump; wings brown, the coverts and inner quills broadly edged with pale yellowish, the outer quills paler brown; the four middle pairs of tail-feathers black, edged with the colour of the back, the outermost white, broadly fringed with black on most of the inner web, the next white, partly black on both the outer and inner webs; chin and malar region white; remaining under-parts dark yellow, washed with ochraceous on the breast; under wing-coverts yellowish white, the carpal edge barred with brown. Wing 85 mm; tail 75; tarsus 25; bill from nostril 9.5 (♂, Tjamba, S. Celebes, 16. VI. 78: Platen — C 5368).

Young (in winter). General colour above hair-brown, somewhat yellower on rump, superciliary stripe whitish; wings and tail much as in adult; under-parts pale buff, sometimes dirty white, browner on chest and sides of breast (Kabruang, 6. X. 93: Nat. Coll. — C 13135—6).

Nestling. Above cinnamon-brownish, blackish on sides of occiput; wings blackish with broad edgings of ochraceous buff; superciliary stripe ochraceous buff; submalar stripe, sides of throat and a bar across the chest black, forming a horse-shoe shield; remaining under-parts ochraceous buff; the two outer pairs of tail-feathers white, the others black edged with ochraceous buff (Dresden, 10. VI. 94: Schwarze — Nr. 14159).

In its nestling plumage the black horse-shoe of *M. flava* recalls the winter plumage of the throat of *M. alba* and *lugubris*; also to some extent the plumage of *Otocorys* and others.

Eggs. 4, 5, sometimes 6; dirty white, closely marbled and clouded with clay-brown, yellowish buff or greyish: size 19.5 × 15 mm (Dresser *VIII*).

Nest. Of fine rootlets, grass, straw, bents, sometimes intermixed with moss; placed on the ground (Dresser *VIII*).

Distribution. In summer almost the whole of Europe; in winter Africa almost to the Cape (Meyer & Helm *a 9*); Asia Minor (Robson *XI*); Transcaspia (Radde *a 4*); Persia (Blanf. *VIII*); S. E. Siberia (Dybows. and Godlews. *a 7*, Schrenck *a 7*); Kamtschatka (Dybows. *XI*, *a 7*); Commodore Is. *(a 7)*; Alaska (Dall & Bannister *VIII*, *a 7*); Kurile Islands *(18)*; Mongolia (David *a 2*); China (Styan *20*, De La Touche *21*); India—eastern part (Oates etc. *a 3*, *19*); Burmah (Oates *a 3*); Andamans and Nicobars *(19)*; Malacca (Cantor *XI*); Sumatra (Buxton *b 5*, Modigl. *a 6*); Natuna Is. (Everett *22*); Java (Horsf. *XI*, Vorderman *b 11*); Bali (Doherty *27*); Flores (Wallace *b 10*, *XI*); Timor (Wallace *b 10*, *XI*); Borneo (Mottley etc. *b 10*, *XI*, *15*); Philippines — Palawan (Whitehead *15*, *16*, Platen *15*), Luzon (Kittl. *b 3*, Conrad *7*, Everett *b 6*), Bohol and Mindanao (Ev. *b 7*, *b 9*), Negros (B. & W. *23*); Talaut Is. — Kabruang (Nat. Coll. *b 13*); Celebes — North (Meyer *b 2*, *b 8*, Bruijn *b 4*, Faber and v. Musschenbr. in Dresd. Mus., P. & F. Sarasin *25*), — South (Wallace *XI*, Meyer *b 8*, Platen in Dresden Mus., Weber *d 1*, etc.), — East (Nat. Coll. *26*); Saleyer and Kalao (Everett *27*); Halmahera, Ternate, Tidore, Buru, Ceram, Amboina (Salvad. *b 10*, Sharpe *XI*).

Motacilla borealis (Sundev.), the *M. viridis* of many authors, is distinguished by Dr. Sharpe from the present species by the absence, or almost complete absence, of the white or pale superciliary stripe and by its black ear-coverts. The two forms have very similar geographical ranges, but there appears to be no evidence that *M. borealis* has ever occurred in the East Indies, whereas the white-eyebrowed *M. flava* has a wide distribution there in winter and often occurs in Borneo in particular, as shown by Whitehead *(14)*, in great abundance.

M. flava again differs in the eastern and western parts of its range. Compared with specimens killed in Saxony, the nine Celebesian examples before us distinguish themselves by their much longer hind claw: viz. 11—14 mm as against 9 mm, a difference already ascertained to exist between European examples and a Celebes one by Prof. W. Blasius *(b 12)* and later confirmed by Mr. J. Büttikofer, who appears to us to misapply the name *borealis*, just as other authors have misapplied — or rather have variously employed — the name *viridis*, which, as Dr. Sharpe shows (Cat. B., X, 522), may well be rejected.

Mr. Brooks (Str. F. 1878, VII, 139) again affirms that Indian specimens of *M. flava* differ from European ones, the head of the latter being darker and the cheeks less mixed with white; this form is allowed by Dr. Sharpe to rank as a valid subspecies, *M. beema* Sykes, its range being "Western and Central Siberia, wintering in Afghanistan and in India", but both *flava* and *borealis* occur in India as well.

The Eastern and Western forms of *M. flava* are equally entitled to subspecific distinction in virtue of the difference in the hind claw; if so separated the Eastern form would have to bear the name *M. flava flaveola* (Pall.). It is also extremely doubtful whether *M. borealis* and *M. cinereicapilla* Savi do not intergrade with the forms of *M. flava*.

The Blue-headed Yellow Wagtail is a winter visitor to Celebes, though individuals remain there, apparently, all the year. Meyer met with it at Limbotto in July, and the adult male described *supra* was shot by Platen on June 16th, 1878, in South Celebes. Everett mentions it as a regular winter migrant found throughout the N. W. coast of Borneo from September to May, and Whitehead saw it in "thousands" on the Tampassuk plains. During his expedition to Palawan the latter naturalist first saw it on 13th September, "when the vanguard passed in a south-westerly direction. In October they were still migrating in hundreds, but were mostly young birds" *(16)*. *M. flava* came on board Meyen's ship on the China Sea between China and Luzon *(3, 4)*, and Mr. Finn (Ibis 1893, 225) mentions specimens, which he took for this species, as having settled on his steamer in the Mediterranean and Red Sea, while Mr. Hartert *(a 8)* writes that specimens accompanied his steamer from the south coast of Arabia all the way to Acheen Head in Sumatra, so making the journey from west to east. In Pegu Mr. Oates found it to be rather a rare winter visitor. It passes through Central China, according to Mr. Styan *(20)*, on migration in spring and autumn, but the Abbé David *(a 2)*, whose observations were made more in the northern part of the country, writes that it is common in China from spring to the end of autumn and particularly abundant in summer in Mongolia. It was not known to Seebohm *(18)* from Japan in 1890.

It breeds in Kamtschatka where Taczanowski *(a 7)* describes it as not rare, but in Dauria Dybowski and Godlewski found it rather scarce.

That some individuals of *M. flava* sometimes remain behind in their winter quarters is an interesting fact, though by no means an isolated one, and tends to prove that migration is not the effect of a blind irresistable impulse driving the bird on its alternate northward and southward journeys.

221. MOTACILLA BOARULA L.

Grey Wagtail.

Two subspecific forms of the Grey Wagtail have so far been distinguished:

1. The typical Motacilla boarula.

a. **Motacilla boarula** *(1)* Linn., Mant. Plant. 1771, 527; *(II)* Gould, B. Eur. 1837, II, pl. 147.
b. **Motacilla sulphurea** *(1)* Bechst., Naturg. Deutschl. 1807, III, 459; *(II)* Naum., Vög. Deutschl. III, 824, t. 87 (1823); *(3)* Newton, ed. Yarr. Br. B. 1873, I, 552; *(4)* Seeb., Br. B. II, 1884, 203, pt.

c. **Motacilla melanope** pt. *(1)* Dresser, B. Eur. III, 251, pl. 128 (1875); *(2)* Sharpe, Cat. B. X, 1885, 497; *(3)* Meyer & Helm, Verz. Vög. Sachsens 1892, 100.

For further synonymy cf. Sharpe *c 2* [references to Europe and W. Asia only].

Figures. Dresser *c I*; Gould *a II*; Naumann *b II*, etc.

Diagnosis. Tail longer, 89—104 mm (Seebohm *i 2* — extremes of forty specimens).

Distribution. Europe to about 54° N. (E. Russia to about 59° and British Isles, rare as far as S. Sweden), N. and N. E. Africa, West Asia. In what part of Asia intermediate forms between this and the next subspecies predominate does not seem to be known.

2. Motacilla boarula melanope (Pall.).

d. **Motacilla melanope** *(1)* Pall., Reis. Russ. Reichs 1776, III, App. 696; *(2)* Legge, B. Ceylon 1879, 610; *(3)* Wardl. Rams., Tweedd. Orn. Works 1881, App. 658; *(4)* Sharpe, Cat. B., X, 1885, 497 pt.; *(5)* Styan, Ibis 1887, 223; *(6)* Büttik., Notes Leyd. Mus. 1887, 70; *(7)* Bligh, Ibis 1888, 316; *(8)* Everett, J. Str. Br. R. A. S. 1889, 103; *(9)* Sharpe, Ibis 1889, 430; 1890, 280; *(10)* Oates, ed. Hume's Nests and Eggs 1890, II, 207; *(11)* id., Fauna Br. Ind., B. II, 1890, 293; *(12)* Steere, List B. & M. Philipp. Is. 1890, 21; *(13)* Sharpe, Ibis 1891, 106; *(14)* Styan, t. c. 321, 343; *(15)* Salvad., Ann. Mus. Civ. Gen. 1891, 68; *(16)* De La Touche, Ibis 1892, 419; *(17)* Styan, Ibis 1893, 428; *(18)* Oust., N. Arch. du Mus. 1894, 5; *(19)* Bourns & Worces., B. Menage Exped. 1894, 37; *(20)* Everett, Ibis 1895, 23, 34; *(21)* Vorderm., N. T. Ned. Ind. 1895, LIV, 345; *(22)* Grant, Ibis 1895, 258; *(23)* id., Ibis 1896, 469; *(24)* Büttik., Notes Leyden Mus. 1896, XVIII, 183.

e. **Calobates melanope** *(1)* Swinh., P. Z. S. 1871, 364; *(2)* David & Oust., Ois. Chine 1877, 302; *(3)* Salvad., Orn. Pap. II, 1881, 431; *(4)* Oates, B. Brit. Burmah 1883, I, 159; *(5)* Salvad., Agg. O. P. 1890, 138; *(6)* Tacz., Faune Orn. Sib. Orient. 1891, 375.

f. **Calobates bistrigata** (Raffl.) *(1)* Salvad., Cat. Ucc. Borneo 1874, 259.

g. **Motacilla sulphurea** (or **sulfurea**) *(1)* Brügg., Abh. Ver. Bremen 1876, V, 66; *(2)* W. Blas., J. f. O. 1883, 120, 156; *(3)* Seeb., Brit. B. II, 1884, 203 pt.; *(4)* id., Ibis 1887, 176.

h. **Budytes novae guineae** *(1)* Meyer, Isis, Dresden 1875, 74.

i. **Motacilla boarula melanope** *(1)* Hartert, J. f. O. 1889, 354; *(2)* Seeb., B. Japan. 1890, 114; *(3)* Hartert, Kat. Vog. Slg. Senckenb. Mus. 1891, 44; *(4)* id., J. f. O. 1891, 203; *(5)* M. & Wg., Abh. Mus. Dresden 1895, Nr. 8, p. 14; *(6)* iid., ib. 1896, Nr. 1, p. 6; *(7)* Hart., Nov. Zool. 1886, 153.

j. **Motacilla boarula** *(1)* Seeb., Ibis 1892, 92; *(2)* Campb., t. c. 239; *(3)* Seeb., Ibis 1893, 49.

"Kendukendu tana", Manado tua, Nat. Coll.

For further synonymy and references cf. Salvad. *e 3*, *e 5*; Sharpe *d 4* [references to Eastern Asia]; Taczanowski *e 6*.

Descriptions. Legge *d 2*, Oates *e 4*, *d 10*; Salvadori *e 3*; Taczanowski *e 5*.

Diagnosis. Tail shorter, 79—95 mm (Seebohm *i 2* — from 50 specimens).

Adult (spring plumage). Above slate-grey, greener on the back; rump and upper tail-coverts yellow-green; wings black, the inner quills with broad pale edges, the coverts edged and tipped with the colour of the back; tail black, edged with yellow-green, the three outer pairs of feathers white, most of the outer web black, except on the outermost pair; superciliary and malar stripe whitish; chin and throat black, sprinkled with whitish; remaining under-parts canary yellow; under wing-coverts and basal part of inner quills below white. Wing 83 mm; tail 91; tarsus 20; bill from nostril 9.5 (Manado tua, 15. IV. 93: Nat. Coll. — C 12142).

Adult (winter plumage). Very like the spring plumage, but the chin and throat white, the yellow of the under surface paler (Manado tua, 19. IV. 93; Nat. Coll. — C 12143).

Eggs. 5, sometimes 6; white, tinted with rose, with subjacent spots of grey, and overlying streaks and little blotches of olivaceous brown; or white, tinted with yellowish, with superjacent spots of reddish brown of little intensity. Size 18.7 × 14.5 mm (Tacz. *e 6*). See, also, Hume *d 10*.

Nest. Mr. Brooks remarks: "The situation chosen for the nest is different, and *C. melanope* (the eastern one) is not nearly such a noisy bird when breeding as *C. sulphurea*. One nest that I found in Cashmere, at Kagan, was placed in a small bush on an island in the Sind river, about 5 feet above the ground. The situation was that of a Finch's nest! It was composed of moss, fibres, etc., and lined with hair, a neat compact nest, and placed in the forks of the branches near the top of the bush" *(d 10)*.

A nest described by Taczanowski *(e 6)* was placed in a bed of flax.

Breeding time. The bird breeds in May and June (Hume *d 10*, Godlewski *e 6*).

Distribution. East Siberia (Gmelin, Middendorff *e 6*); Commodore Is. (Stejneger *e 6*); Kurile Is. (Snow *i 2*); Japan (Cassin, Siebold, etc. *i 2*, *d 4*); Loochoo Is. (Pryer *i 2*, Holst *j 3*); Corea (Kalinowski *e 6*, Campb. *j 2*); China (Swinhoe *e 1*, David *e 2*, etc.); Hainan and Formosa (Swinhoe *e 1*); Tian-Shan (Bonvalot & Pr. d'Orléans *d 18*); Himalayas (Brooks *d 10*); Afghanistan (W. Ramsay *d 10*); Indian Peninsula (Oates, etc., *e 4*, *d 2*); Ceylon (Legge *d 2*, Bligh *d 7*); Andamans and Nicobars (Davison *d 2*); Burmah (Oates *e 4*); Tenasserim (Davison *e 4*); Malay Peninsula (Cantor, etc. *d 4*, *e 4*, *d 11*); Sumatra (Raffl., Buxton, Beccari *e 3*, Modigliani *d 15*); Nias (Kannegieter *d 23*); Java (Wallace *d 4*); Lombok (Vorderman *d 21*); Borneo (Doria & Beccari *e 3*, Wallace, etc. *d 8*); Philippines — Palawan (Steere *d 12*), Luzon, Cebu, Leyte (Meyer, Everett *d 3*), Guimaras, Panay, Negros, Samar, Basilan (Steere *d 12*), Mindanao (Everett *d 3*, Steere *d 12*), Sooloo, Tawi Tawi, Tablas, Romblon, Sibuyan, Masbate (Bourns & Worcester *d 19*); North Celebes (Fischer *g 1*, *g 2*, Platen in Mus. Nehrk., Nat. Coll. in Dresd. Mus., Sarasin Coll.), South Celebes (Everett *i 7*); Morty, Ternate, Batchian, Amboina, Waigiou (*e 3*, *e 5*); Mount Arfak, New Guinea (Meyer *h 1*, *e 3*).

As in the West, so also in the East, the Grey Wagtail is a migrant, and in this part of its range it proceeds to the East India Islands, Further India, India and Ceylon in winter. Taczanowski records the observations of v. Schrenck, Dybowski, Godlewski and Kalinowski as to its breeding in Corea and various parts of East Siberia, but not in the Arctic Region; Mr. Brooks obtained its nest in Cashmere, and Major Wardlaw Ramsay in Afghanistan. It passes through Central China on migration in spring and autumn, as Mr. Styan shows *(d 14)*; but Mr. De La Touche *(d 16)* says it winters in South China, and this also seems to be the case in the Loochoo Islands from where Seebohm *(j 3)* records two specimens killed by Mr. Holst in January. It reaches the East India Islands in winter in much smaller numbers than *Motacilla flava*; nevertheless in the last twenty years the bird has turned up in a continuous line of localities from Luzon to New Guinea. Its chief winter-quarters would appear to be India, Burmah and Ceylon; in some localities in these countries it is very abundant in the cold season. It seems to resort to Manado tua Island in some numbers; in April 1893 our hunters obtained

4 examples there, and towards the end of May, 1894, 5 examples, the last being a late date for a migratory species.

An observation of singular interest connected with the winter migration of this Wagtail in the East is recorded by Mr. S. Bligh (*d 7*), who when travelling in Ceylon on 24th November, 1887, was attracted by seeing several Wagtails (*M. melanope*) towards evening "on the top of a low bazaar-building (a native shop); in a few minutes the number was doubled, and by this time small troops of them kept passing the rest-house, and other flocks were gathering from all sides, till thousands had collected; Swallows (*Hirundo rustica*) then began to arrive in flocks, and all commenced sweeping round over a small garden of native coffee of an acre or two in extent . . . The rest-house keeper . . . told me that they came there all the last cold season, for the first time, to roost in the coffee. By this time a vast swarm of the two species had arrived and it was getting dusky. The rest-house keeper sent a boy to frighten up those that had settled; they went up in a cloud, and the rustling of their tiny wings was distinctly heard by me a hundred yards off; they rose in a copula-shaped mass, and were as thick as bees in a swarm; there must have been 30,000 or 40,000 birds on the wing at that moment, the Wagtails forming, as I estimated, about a third or fourth of the number. The boy was called away, and soon all the birds descended before it was quite dark; when settled, the Swallows kept up an incessant simmering chirping for some time, but I could not hear a Wagtail's note at all. The sight was a wonderful one; at daylight the birds all departed very quickly and quietly".

It is of much interest to know that the birds returned to the same spot two years in succession, and in such numbers; a similar case of migratory *Collocaliae* resorting for more than one year to an old shed in the Andamans has been described by Davison (see *Collocalia fuciphaga*, p. 332). Such facts speak strongly for traditional (if the word can be used) migration routes. The phenomenon of migration assumes a simpler aspect if it be that birds have certain well-known resting-places at stages in their long journey — well-known at least to the older travellers, which again acquired their experience from the previous generation. Pigeon-fanciers know that their birds cannot find their way in an unknown country.

GENUS ANTHUS Bchst.

The Pipits wear a Lark-like plumage of tawny, streaked above and more or less on the under parts with black or blackish. This, and their short tails and pale legs will serve to distinguish them from the Wagtails, to which they are very like structurally. The tarsus is scutellated in front, but covered with an entire lamina behind, which forms a means of distinguishing them from the Larks, in which the tarsus is scutellated behind as well as before. The Pipits nest on the ground, laying mottled eggs. They are found both in the Old and New Worlds, but in the East not further than Celebes, the Moluccas and Timor.

222. ANTHUS GUSTAVI Swinh.

Siberian Pipit.

Anthus gustavi *(1)* Swinh., P. Z. S. 1863, 90; *(2)* id., Ibis 1874, 442; *(3)* Brügg., Abh. Ver. Bremen 1876, V, 67; *(4)* Seeb., Ibis 1877, 128; *(5)* Tweedd., Ibis 1877, 258; *(6)* Sharpe, Tr. Z. S. (2) I, 1877, 338; *(7)* Tweedd., P. Z. S. 1878, 430; *(8)* Seeb., Ibis 1878, 341; *(9)* Sharpe, Ibis 1879, 262; *(10)* Guillem., P. Z. S. 1885, 415; *(11)* id., ib. 552; *(12)* id., ib. 572; *(12)* Sharpe, Cat. B., X, 1885, 613; *(13)* Wardl. Rams., Ibis 1886, 160; *(14)* Styan, Ibis 1887, 223; *(15)* Sharpe, Ibis 1888, 201; *(16)* W. Blas., Ornis 1888, 314; *(17)* Sharpe, Ibis 1889, 431; *(17bis)* Everett, J. Str. Br. R. A S. 1889, 103; *(18)* Whitehd., Ibis 1890, 52; *(19)* Sharpe, t. c. 280; *(20)* W. Blas., J. f. O. 1890, 139; *(21)* Steere, List Coll. B. & M. Philipp. Is. 1890, 21; *(22)* Styan, Ibis 1891, 321, 344; *(23)* Tacz., Faun. Orn. Sib. Orient. 1891, I, 398; *(24)* De La Touche, Ibis 1892, 420; *(XXV)* Meyer, Abb. v. Vogelskel. II, 1892, p. 45, t. CLXXI; *(26)* Sharpe, Ibis 1894, 259; *(27)* Bourns & Worces., B. Menage Exp. 1894, 38; *(28)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 6; *(29)* Hart., Nov. Zool. 1896, 168; *(30)* Grant, Ibis 1896, 554.

a. **Anthus batchianensis** *(1)* Gray, HL. I, 1869, 251, Nr. 3642.

b. **Corydalla gustavi** *(1)* Swinh., P. Z. S. 1871, 366; *(2)* Wald., Tr. Z. S. 1872, VIII, 117; *(3)* Meyer, J. f. O. 1873, 405; *(4)* David & Oust., Ois. Chine 1877, 309; *(5)* Salvad., Orn. Pap. II, 1881, 432; *(6)* Pleske, Bull. Ac. Sc. Petersb. 1884, 128; *(7)* Salvad., O. P. Agg. 1890, 138.

c. **Anthus seebohmi** *(1)* Dresser, B. Eur. III, 295, pl. 134 (1875); *(2)* Seeb. & Har. Brown, Ibis 1876, 120; *(3)* Dresser, t. c. 180; *(4)* Brooks, t. c. 501; *(5)* Finsch, Ibis 1877, 58; *(6)* Seeb. t. c. 128.

d. **Anthus stejnegeri** *(1)* Ridgw., Pr. U. S. Nat. Mus. 1883, 95, 369.

For further references see Salvad. *b 5*; Sharpe *12*; Tacz. *23*.

Figures and descriptions. Dresser *c I*; Meyer *XXV* (skel.); Swinhoe *1*; Brüggemann *3*; Salvadori *b 5*; Sharpe *12*; Taczanowski *23*.

Adult male (October). Head and neck ochraceous brown, with broad black centres to the feathers; lores buff, with black hair-points intermingled; ear-coverts dull brown; a rictal and a submalar streak (extending to side of neck) of sooty black spots, with a buff stripe between them; mantle black, with light ochraceous buff margins to the feathers; lesser wing-coverts black, margined with olive-brown; middle series black, broadly tipped with fulvous white; greater series and inner quills black, externally margined and tipped with tawny; primaries and tail-feathers dusky, externally margined with tawny, the outermost tail-feather white, dusky towards base, the next with the terminal third white, the outer margin dusky; lower back and upper tail-coverts olive-brown, the centres of the feathers black; chin and throat cream-white; remaining under-parts buffy white, clear on the abdomen and under tail-coverts, broadly streaked with sooty on breast, sides and flanks. Wing 84 mm; tail 58; tarsus 23; bill from nostril 10 (♂, Rurukan, Minahassa, 5. X. 87: Platen in Mus. Nehrk., Nr. 1847). "Iris brown; bill above dark brown, below and feet light brown" (Pl.).

Another example answering to Mr. Dresser's plate and descriptions was obtained by our native collectors in Manado tua, 26th May, 1894 (C 13365).

Sex. The sexes are similar.

Remark. Dr. Sharpe *(12)* considers that the species is more richly coloured on its return to its breeding quarters (May).

Skeleton.	Length of cranium . . .	30.5 mm	Length of fibula	7.7 mm
	Greatest breadth of cranium	10.0 »	Length of tarso-metatarsus	24.0 »
	Length of humerus . . .	19.5 »	Length of digitus III .	ca. 17.0 »
	Length of ulna	24.6 »	Length of sternum . . .	23.0 »
	Length of radius	22.0 »	Greatest breadth of sternum	ca. 10.5 »
	Length of manus	22.0 »	Height of crista sterni . .	7.3 »
	Length of metacarpus . .	12.0 »	Length of coracoideum . .	18.5 »
	Length of digitus principalis	9.8 »	Length of scapula	22.5 »
	Length of femur	18.0 »	Length of clavicula . . .	16.3 »
	Length of tibia	33.0 »	Length of pelvis	26.8 »

Eggs. Usually 5; ground-colour obscured with brown and grey spots, occasionally forming a ring at the larger end; size 20 × 14 mm (Petchora, Seebohm *c I*). Pale vinous ground, varied with a multitude of streaks and very small spots of reddish brown, everywhere very dense, thickest on the large end; a substratum of pale greyish rose spots; often with some veins of black; gloss slight; av. size 20.4 × 14.9 mm (Kamtschatka and Behring Id. — ex Tacz. *23*).

Nest. Of flat leaves, water-plants and small leaves (Seebohm *c I* — Petchora). Chiefly grasses, mixed with a small number of fine stalks of other plants, a few black and white horse-hairs inside interlaced with the other materials; external diam. 90, internal 60 mm (Kamtschatka — Taczanowski *23*).

Distribution. Europe — Petchora valley (Seebohm & Harvie-Brown *c I*, *c 2*); North Asia — Obi (Finsch *c 5*, *12*), Yenesei (Seebohm *8*), Altai *(23)*, Dauria (Moszynski *23*), Kamtschatka (Dybowski *23*), Commodore (Commander) Is. (Stejneger *23*); North China — Chefoo (Swinhoe *2*), Central China — Kiangsi (David *b 4*), South China (Styan *14*, De La Touche *24*); Philippines — Luzon (Othberg *3*, *7*, Mait.-Heriot *13*), Negros (Everett *30*), Leyte, Guimaras, Basilan (Steere *6*, *21*), Tawi Tawi, Sibuyan, Romblon and Masbate (B. & W. *27*), Palawan (Whitehd. *15*, *18*, Platen *16*); Borneo (Treacher, Ussher, etc. *9*, *10*, *17bis*); North Celebes (Meyer *b 2*, *b 3*, Rosenb. *12*, Fischer *3*, Guillemard *11*, Platen, etc.); Manado tua (Nat. Coll. in Dresd. Mus.); Djampea and Kalao (Everett *29*); Batchian (Wallace *b 5*, Guillem. *12*), Ternate (Fischer *b 6*, *b 7*); Timor (Wallace *12*).

This Pipit was first obtained by Mr. Wallace in Batchian, but was not immediately described as new by G. R. Gray, and it was rediscovered rather more than thirty years ago by Swinhoe on the island of Amoy during the bird's transit from its winter quarters to its breeding grounds in May. Since then, thanks to the observations of Swinhoe, Seebohm, Dybowski, Stejneger and others, a fairly good knowledge of its distribution, habits and migration has been obtained. Five nests were found by Messrs. Seebohm and Harvie-Brown on the Petchora, at the end of June and beginning of July, 1875; then it was again found breeding by Seebohm in the valley of the Yenesei in July, by Dr. Dybowski in Kamtschatka, and by Dr. Stejneger in the Commander Islands. In the last locality it is one of the commonest birds; the first eggs were obtained on the 30th May, and eggs of the second sitting in July. In North China Swinhoe *(2)* observed that numbers pass on migration near Chefoo, but in South China Messrs. Styan and De La Touche have very rarely met with

it. Its chief winter quarters seem to be Borneo, Celebes and the Philippines. Mr. Whitehead *(18)* observed that it arrived in Palawan in company with *Motacilla flava* about September 20th, and he notes from North Borneo *(17)* that it prefers the forest to open places and frequents the ground. In Celebes itself the bird has as yet been found in the Northern Peninsula only, like a great many other species which cross from the north-west. It has not yet been recorded, as far as we know, from any of the Indian countries, Siam, Malacca, Sumatra or Java, except that there is a specimen in the British Museum which "may have been obtained in Burmah or Malacca", but, as Dr. Sharpe *(12)* believes, more probably came from the N. W. Himalayas. In its remarkably broad northward range from Kamtschatka across all Siberia to European Russia and in its restricted winter quarters in the East India Islands *Anthus gustavi* corresponds, as Mr. Seebohm *(8)* and Count Salvadori *(b 5)* have remarked, to *Phylloscopus borealis*, and it remains for the future to show whether the individuals which nest in Europe wander eastward across Siberia in autumn and then turn south and cross the China Sea to the East Indies, or whether they visit other localities.

223. ANTHUS CERVINUS (Pall.).

Red-throated Pipit.

a. **Motacilla cervina** *(1)* Pall., Zoogr. Rosso-Asiat. 1811, I, 511.

Anthus cervinus *(I)* Naum., Vög. Deutschl. III, pl. 85, f. 1 (1823); *(2)* Sharpe, Cat. B. 1885, X, 585; *(3)* Everett, J. Str. Br. R. A. S. 1889, 103; *(4)* Oates, Faun. Br. Ind. B. II, 1890, 310; *(5)* Seeb., B. Japan 1890, 117; *(6)* Steere, List Coll. B. & M. Philipp. 1890, 21; *(7)* Tacz., Faun. Orn. Sib. Orient. 1893, I, 402; *(8)* Everett, Ibis 1895, 34; *(9)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 6.

For further synonymy and references cf. Sharpe *2*; Taczanowski *7*.

Figures and descriptions. Naumann *I*; Gould, B. Asia IV, pl. 66 (1869); Dresser, B. Europe III, pl. 136; Sharpe *2*, Oates *4*, Taczanowski *7*, etc., etc.

Adult male. Above broccoli-brown, with blackish middles to the feathers, the rump more cinnamon, the tips of the middle and greater wing-coverts paler and rather broad; loral region, face, throat, and chest vinaceous-rufous, more cinnamon on the ear-coverts; remaining under parts salmon-buff, streaked on the sides of the breast, sides, and flanks with dusky, remiges below dusky greyish, paler where they rest upon the body; tail below dusky, the outermost feather white, except on the inner and basal portion of the inner web, the outer web impure white, a small spot of white on tip of next rectrix (♂, Summit of Mount Soputan, N. Cel., 29. IV. 95: P. & F. Sarasin). Wing 85 mm; tail c. 65; tarsus 22; bill from nostril 8.5.

"Bill horn-brown, with the mandible pale flesh-colour to near the extremity; feet yellowish flesh-colour, nails whitish; iris deep brown" (Taczanowski *7*).

Female. In winter plumage does not have the rufous throat (summer dress) seen in some males in winter as well as in summer; "the throat is yellowish white like the abdomen, the breast and sides of the body very thickly and broadly spotted and streaked with black as in the summer plumage" (Sharpe *2*).

For nidification cf. Dresser, etc., l. c.

Distribution. "Breeds throughout Northern Europe and Siberia, above the limits of forest-growth. Occasional in England and Western Europe on migration. Winters in Egypt and North-eastern Africa, Persia, and North-western India, but principally in Southern China and the Burmese countries extending at least to Borneo . . . has been met with in winter as far south as California" (Sharpe *2*).

In the East India Islands: Philippines — Mindanao and Basilan (Steere *6*), Palawan (Everett *8*); West Borneo (Everett *3*); North Celebes — Mt. Soputan (P.& F. Sarasin *9*).

A single example of this wide-spread migrant was obtained on the summit c. 6000 ft. of Mount Soputan in the Minahassa on April 29th, 1895, by the Drs. Sarasin.

It is distinguishable from *A. gustavi* by having almost no white on the second rectrix, by its smaller bill, by the greyer brown — not tawny-olive — tint of the upper surface, and in the summer and old-male dress by the vinous-rufous throat.

Compared with two examples from Archangel the specimen from Celebes has a decidedly small bill and a paler upper surface.

FAMILY PLOCEIDAE.

The *Passeres* of Celebes hitherto treated of have been more or less insectivorous birds; the present family and the hardly separable *Fringillidae* are in the main seed-eaters. Sharpe (Cat. B. XIII, 1890, 198) and Oates (Fauna Brit. India, Birds II, 1890, 174) divide the *Ploceidae* into two subfamilies, the *Ploceinae*, or Weaver-birds, with the first primary about as long as the tarsus, and the *Viduinae*, in which the first primary is reduced to a minute pointed feather, not likely to be noticed unless looked for, a subfamily embracing the Widow-birds and Munias. The true *Viduinae*, or Widow-birds, form, as Newton remarks (D. B. p. 1028), a very natural group, and it is preferable to hold the other forms apart as *Estrildinae*. Perhaps the character: tail shorter than the wing — may serve to distinguish the latter, which alone occur in Celebes.

GENUS MUNIA Hdgs.

The size of a Sparrow or less. Bill very stout, conical, generally shorter than the cranium, the maxilla without a ridged culmen, broad, raised above the level of the cranium, the culmen posteriorly forming an apex which parts the anterior frontal feathers mesially; nostrils in front of the forehead, more or less concealed; tomia not denticulated; wing longer than tail, 2nd and 3rd primaries longest, the 1st very minute; tail graduated to nearly square; tarsus shorter than middle toe and claw, anteriorly scutellated. The eggs are white, the nest of grasses, etc., round, with the entrance in the side.

Found in the Indo-Australian area, and in Eastern Africa.

224. MUNIA ORYZIVORA (L.).

Java Sparrow.

a. **Loxia oryzivora** *(1)* Linn., S. N. 1766, I, 302.

Munia oryzivora *(1)* Bp., Consp. 1850, I, 451; *(2)* E. Newt., Ibis 1861, 115; *(3)* Bernst., J. f. O. 1861, 179; *(4)* Sclat., P. Z. S. 1863, 219; *(5)* Wall., t. c. 486; *(6)* Hartl., Vög. Madag. 1877, 404; *(7)* Shelley, Ibis 1886, 312; *(VIII)* Bartl., Weaver-b. pl. 1 (1888); *(9)* Sharpe, Cat. B., XIII, 1890, 328; *(10)* Oates, ed. Hume's Nests & Eggs 1890, II, 128, note; *(11)* id., Fauna Br. Ind. 1890, II, 182, note; *(12)* Büttik., Zool. Erg. Weber's Reise Ost-Ind. 1893, III, 280; *(13)* Finn, Ibis 1893, 226; *(14)* Bourns & Worces., B. Menage Exp. 1894, 37; *(15)* Vorderm., N. T. Ned. Ind. 1895, LIV, 346; *(XVI)* Butler, Foreign Finches 1894—96, pl. pt. VIII; *(17)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 13; *(18)* Hart., Nov. Zool. 1896, 546, 594.

b. **Padda oryzivora** *(1)* Horsf. & Moore, Cat. B. Mus. E. I. Co. 1856, II, 504; *(2)* Melliss, Ibis 1870, 100; *(3)* Stölker, J. f. O. 1870, 81; *(4)* id., ib. 1872, 19; *(5)* Wald., Tr. Z. S. 1872, VIII, 72; *(6)* Salvad., Cat. Ucc. Borneo 1874, 263; *(7)* Sharpe, Tr. L. S. 1877, (2) I, 308, 345; *(8)* David & Oustalet, Ois. Chine 1877, 344; *(9)* Stölker, J. f. O. 1877, 444; *(10)* Hume & Davis., Str. F. 1878, VI, 403; *(11)* Meyer, Ibis 1879, 132; *(12)* Legge, B. Ceylon 1880, 646; *(13)* Kutter, J. f. O. 1885, 352; *(14)* W. Blas., Ztschr. ges. Orn. 1885, 292; *(15)* Vorderman, N. T. Ned. Ind. 1885, XLIV, 222; *(16)* Whitehd., Ibis 1889, 433; *(17)* Everett, J. Str. Br. R. A. S. 1889, 142; *(18)* Sharpe, Ibis 1890, 280; *(19)* Steere, List Coll. B. & M. Philipp. Is. 1890, 23; *(20)* Hagen, Tdschr. Ned. Aard. Genoots. 1890 (2), VII, 153; *(21)* Styan, Ibis 1891, 356; *(22)* De La Touche, Ibis 1892, 426.

"Burong gottollo", Malay, Celebes, Meyer *b 11.*

"Bingissi Djava", Macassar, Platen *b 14.*

For further synonymy and references cf. Sharpe *9.*

Figures and descriptions. Bartlett *VIII*; Butler *XVI*; Swains., Zool. Illustr. III, pl. 156 (1822—23); Russ, Stubenvög. 1879, 136, Taf. VIII, f. 33; David & Oust. *b 8*; Hume & Davis. *b 10*; Legge *b 12*; Vorderman *b 15*; Sharpe *9.*

Adult. Head, nape, chin and upper throat black; cheeks and ear-coverts white; upper surface and breast grey, quills browner, becoming more vinaceous on the sides and abdomen, and white on the under tail-coverts; tail and upper tail-coverts black. Wing 67 mm, tail 43, tarsus 28, bill from nostril 11 (♂, Macassar, Oct. 1871: Meyer — C 404). Iris red, orbital ring red; bill red, tip white; feet red (Platen *b 14*).

Sexes. Similar.

Young. Without the black head and throat; general colour isabelline above and below, greyer above, especially on the wings; rectrices blackish (♂, Segeri, S. Celebes, Sept. 1871: Meyer — C 405). Iris brownish red (Bernstein *3*).

Eggs. 6—8; glossy white, rather long; size 21 × 14 mm (Bernstein *3*). "Uniform white, measuring on an average 20 × 14" (Nehrkorn MS.).

Nest. Of various grass-stalks, rather loosely woven; larger in size and semi-globular in shape when placed in tree-tops, smaller and irregular in shape when built among parasites on the Areng palm (Bernstein *3*).

Distribution. Java (Horsf. *b 5*, *9*, Bernst. *3*, etc.) — Introduced into many other countries, perhaps native to some of them: Bali (Doherty *18*); Lombok (Wallace *5*, *9*); Celebes — Macassar (Wallace *b 5*, Meyer *b 11*, Platen *b 14*, Weber *12*, Sarasins *17*),

Segeri (Meyer *b 11*), Manado (Meyer *b 11* in Dresd. Mus.); Philippines — Mindanao, Guimaras, Luzon (Steere *b 7, b 19*, Mait. Heriot *9*), Panay and Samar (Bourns & Worcester *14*); Borneo (Mottley *4*, etc., *b 5, b 17*); Sumatra (Raffl. *b 5*, Buxton *9*, Hagen *b 20*); Singapore (Davison *9*); Malay Peninsula (Cantor *b 5*); Cochin China (Pierre *9*); South and Central China (David *b 8*, Styan *b 21*, etc.); Japan (Brit. Mus. *9* and Dresd. Mus.); Tenasserim (Berdmore *b 10*, Brit. Mus. *9*); S. India near Madras (Hume *b 10, 10, 11*); Ceylon (Legge *b 12*); Mauritius and Réunion *(6, 2, 7)*; Seychelles (Brit. Mus. *9*); Zanzibar (Kirk *7, 9*, Finn *13*); Pangani (Kirk *9*); St. Helena (Melliss *b 2*).

Originally the Java Sparrow was most likely a native of the island of Java alone, and owes its presence in other parts of the world, where it is now found wild, to the escape of caged specimens or to intentional introduction by man. In Java it exists in great numbers. In its more distant localities, such as St. Helena, Zanzibar, Bourbon and Mauritius, it is known to have been introduced, and Legge, Hume, and Oates regard this as the case in Ceylon and Madras. Proof of its introduction into Tenasserim may now be impossible to obtain. In China the species is to some extent a migrant, showing — if we may assume its recent importation there — how readily the habit of migration is adopted, without the aid of glacial epochs or anything of the kind. It is much appreciated as a cage-bird, not only in Europe, but in China, Ceylon, Borneo, and elsewhere. In Labuan Whitehead believes the bird to be an importation of the Hon. Hugh Low, and it is now abundant and increasing. It is believed by Hagen *(b 20)* to have been introduced into Sumatra. In Celebes itself the species is common near Macassar, but rare in the North, where it has only been found by Meyer near Manado.

The wants of the Java Sparrow are much the same as those of man, the grain which the latter cultivates suiting the former very well, and hence the readiness with which the bird becomes acclimatized around towns and settlements in the East.

Cases of albinism in this species are very common.

Munia oryzivora is a very distinct species, easily recognisable by its white cheeks and ear-coverts among all other species of *Munia*, excepting its nearest ally, *M. fuscata* of Timor, which has the fore-neck and breast light chocolate-brown, the remaining under-parts white, separated from the brown chest by a band of black (Sharpe).

225. MUNIA FORMOSANA Swinh.

Brown Munia.

Dark specimens of *M. brunneiceps* of Celebes and Borneo intergrade with light ones of *M. jagori* of the Philippines; these forms are, therefore, subspecies. *M. brunneiceps* again, according to Sharpe, is a subspecies of *M. formosana*. We have no sufficient material for comparing *M. atricapilla* and *rubronigra* of

the Indian countries and Malacca, which probably intergrade with *brunneiceps*, consequently we treat only of the three former as subspecies under the oldest species-name, *formosana*.

1. The typical Munia formosana.

a. **Munia formosana** *(1)* Swinh., Ibis 1865, 366; *(2)* Wald., Tr. Z. S. 1875, IX, 207; *(3)* David & Oust., Ois. Chine 1877, 342; *(4)* Salvad., O. P. II, 1881, 438; *(5)* Sharpe, Cat. B. 1890, XIII, 338; *(6)* Grant, Ibis 1895, 112.

For further references cf. Sharpe *a 5*.

Descriptions. Swinhoe *a 1*; David & Oust. *a 3*; Sharpe *a 5*.

Diagnosis. Head all round blackish brown, faded brown on occiput and nape.

Distribution. Formosa (Swinhoe *a 1*, *a 5*); Luzon (Whitehead fide Grant *a 6*).

2. Munia formosana jagori (Marts.).

b. **Munia (Dermophrys) jagori** [Cab. in Mus. Berol.] *(1)* v. Martens, J. f. O. 1866, 14.

c. **Munia jagori** *(1)* Wald. *a 2*; *(2)* Salvad., Orn. Pap. II, 1881, 437; *(3)* Wardl. Rams., Tweedd. Orn. Works, Index 1881, 658; *(4)* Everett, J. Str. Br. R. A. S. 1889, 142; *(5)* Sharpe, Cat. B., XIII, 1890, 337; *(6)* Whitehd., Ibis 1890, 56; *(7)* Steere, List Coll. B. & M. Philipp. Is. 1890, 23; *(8)* Hartert, J. f. O. 1891, 203; *(9)* Sharpe, Ibis 1894, 257; *(10)* Grant, Ibis 1896, 554.

d. **Munia atricapilla** *(1)* Sharpe, Ibis 1888, 202.

d^{bis}. **Munia brunneiceps** *(1)* Grant, Ibis 1895, 261.

For further references cf. Salvad. *c 2*, Sharpe *c 5*.

Descriptions. Salvadori *c 2*; Sharpe *c 5*.

Diagnosis. Head all round entirely brownish black.

Distribution. Philippine Islands: — Luzon, Cebu, Leyte, Bohol, Basilan, Tawi Tawi, Calamianes, Tablas, Romblon, Sibuyan, Siquijor, Catanduanes, Negros, Mindoro, Palawan, Mindanao, Sooloo *(c 3, c 6, c 5, c 7, c 9)*; Halmahera (Meyer *c 2* and in Dresd. Mus.).

3. Munia formosana brunneiceps (Wald.).

e. **Amadina sinensis** *(1)* Motl. & Dillw., Nat. Hist. Labuan 1855, 25, pl. 6[1]).

f. **Munia malacca** *(1)* Sclat. (nec. L.), P. Z. S. 1863, 219.

g. **Munia brunneiceps** *(1)* Wald., Tr. Z. S. 1872, VIII, 73 pl. IX; *(2)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 666; *(3)* Wald. *a 2*; *(4)* W. Blas., J. f. O. 1883, 138; *(5)* id., Ztschr. ges. Orn. 1885, 293; *(6)* Sharpe, Ibis 1889, 434; *(7)* Everett, J. Str. Br. R. A. S. 1889, 142; *(VIII)* Bartl., Mon. Weaver-b. fig. pt. III (1889); *(9)* Sharpe, Cat. B., XIII, 1890, 338; *(10)* Büttik., Zool. Erg. Weber's Reise Ost. Ind. 1893, III, 280; *(11)* Sharpe, Ibis 1894, 257.

h. **Munia jagori** *(1)* Meyer, J. f. O. 1873, 405; *(2)* id., Ibis 1879, 132, 146.

i. **Munia atricapilla** pt. *(1)* Salvad., Cat. Ucc. Borneo 1874, 265.

j. **Amadina brunneiceps** *(1)* Brügg., Abh. Ver. Bremen 1876, V, 75.

k. **Spermestes (Munia) brunneiceps** *(1)* Russ, Gefied. Welt 1879, 382.

l. **Munia formosana brunneiceps** *(1)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 14; *(2)* iid., ib. 1896, Nr. 1, p. 13.

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[1]) Dr. Sharpe believes this figure to be of the true *M. atricapilla* (Vieill.).

m. **Munia atricapilla brunneiceps** *(1)* Hart., Nov. Zool. 1896, 154; *(2)* id., ib. 1897, 161.

"Bingissi", Tjamba Distr., S. Celebes, Platen.

"Burong gotollo", Malay for all *Ploceidae*, Celebes, Meyer *h 2*.

Figures and descriptions. Wald. *g I*; Bartl. *VIII*; Sharpe *f 9*; Russ *k 1*.

Diagnosis. Head all round blackish brown.

Distribution. Celebes: — South: Macassar (Wallace *g I*, Meyer *h 2*, etc.), Tjamba (Platen *g 5* and in Dresd. Mus.), Tempe and Palopo (Weber *g 10*); Posso Lake, Centr. Cel. (P. & F. Sarasin *l 2*); West Celebes (Doherty *m 2*); Minahassa (Meyer *h 2*, Rosenb. *j 1*, etc.); Togian (Meyer *h 2*); South Borneo — Banjermassing (Mottley *g 3*, *g 9*), N. W. Borneo (Everett *g 7*, etc.); Labuan (Mottley etc., *i 1*, *g 6*, *g 9*).

Adult. Head all round blackish brown, becoming blacker on the throat and breast; remaining parts brownish hazel, darker below, and upper tail-coverts glossy and redder, abdomen, thighs and under tail-coverts blackish. Wing 51 mm; tail 33; tarsus 16; bill from nostril 8 (Manado, March, 1871: Meyer — C 398). Iris brown; bill bluish; feet and claws light greyish blue (M. *h 2*).

The specimen described is inseparable from some examples of *jagori*, proving that we have to do with intergrading subspecies in *jagori* and *brunneiceps*; if this were not the case, they would not be subspecies, but species.

Sexes. The sexes are similar.

Young. General colour wood-brown, rather darker on the mantle and wings, greyer on the head. A few black feathers on the under tail-coverts and crissum. "Iris brown; bill and feet lead-grey" (♀ juv., Tjamba Distr., 27. VI. 78: Platen — C 5378).

Skeleton (Meyer, Abb. v. Vogelskel. 1894, II, pl. CCIV).

Length of cranium . . .	23.0 mm	Length of tarso-metatarsus	15.5 mm
Greatest breadth of cranium	12.0 »	Length of digitus I . . .	14.0 »
Length of humerus . . .	14.0 »	Length of digitus II . .	12.5 »
Length of ulna	16.0 »	Length of digitus III . .	19.0 »
Length of radius	13.5 »	Length of digitus IV . .	14.0 »
Length of manus	15.0 »	Length of sternum . . .	19.0 »
Length of metacarpus . .	7.0 »	Greatest breadth of sternum	10.0 »
Length of digitus I . . .	3.0 »	Height of crista sterni . .	6.2 »
Length of digitus II . . .	6.5 »	Length of coracoideum . .	13.7 »
Length of digitus III . .	2.5 »	Length of scapula . . .	16.0 »
Length of femur	14.0 »	Length of clavicula . . .	14.5 »
Length of tibia	24.0 »	Length of pelvis	17.0 »
Length of fibula	8.0 »	Greatest breadth of pelvis	11.0 »

Egg. Short oval, white, thick-shelled and chalky: size 14.5 × 12 mm (Tomohon, Minahassa, 15. VI. 94, P. & F. Sarasin).

Nest. The nest, which contained the above-mentioned egg, is pendant pear-shaped, the entrance-hole in the side near the top; almost entirely composed of a fine yellowish grass from which the seeds have fallen; a few bits of broad, dead flag-leaf interwoven; greatest external diameters about 200 × 120 mm, walls very thick, except at the bottom (Sarasin Coll.).

The arbitrary denomination of subspecies is a work which both vexes the conscience and gives a lot of literary trouble to him who thus makes a show of knowledge which he does not possess of the racial variation of the species,

and, when done, his results are likely to cause still more trouble and annoyance to the next worker, who will perhaps supersede them with guesses of his own equally erroneous. The above subdivision of *Munia formosana* partakes perforce of this arbitrary character, because the writers find that they have not the right, by reason of insufficient material for comparison, to unite several "species" which they believe should be united, but which have such close relations with Celebes that they could not be ignored; the only plan, therefore, was to let them stand as supposed subspecies, though it remains for some one else, who, it is to be hoped, will have an eye for seasonal, individual and age variation as well, to show what geographical differences are prominent and where trinomials may be really well applied, if applied at all.

Munia brunneiceps was originally separated by Walden in virtue of its brown head. It was described from Macassar. There are two specimens from here in the Sarasin Collection and these have paler heads than others from N. and Central Celebes. One is younger than the other and has the head palest (walnut-brown), and the back more rufous and less purplish. Three more Northern Celebes examples have the head about as dark as in others from Cebu and Negros. Mr. Grant considers that "*M. brunneiceps* is merely the worn autumn plumage of *M. jagori*" (Ibis 1896, 554). Mr. Hartert has called the birds of the Natuna Islands *brunneiceps*, but afterwards thought them to differ by their much darker heads and more rufous backs *(m 2)*.

In Celebes the bird is rather common. It is one of the commonest species, as Mr. Whitehead says, in North Borneo, and Dr. Sharpe *(g 6)* has suggested that it may have been introduced there from Celebes. It appears to us at least as probable that this Weaver-bird is a more recent addition to the Celebes avifauna, derived from Borneo, and more originally perhaps from the Indian countries, where *M. atricapilla* differs in having less black or none at all on the belly. In Labuan, however, the bird seems to have made a recent incursion, and, according to Mr. Whitehead *(g 6)*, it has to a large extent driven away *Munia fuscans* (Cass.) from the island.

226. MUNIA PALLIDA Wall.

Lombok White-headed Munia.

Munia pallida *(1)* Wall., P. Z. S. 1863, 486, 495; *(2)* Platen, Russ and Meyer, Gefied. Welt 1879, 351 and 361; *(3)* Sharpe, Cat. B., XIII, 1890, 346; *(4)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 13; *(5)* Hart., Nov. Zool. 1896, 154, 559, 594.

a. **Donacola pallida** *(1)* Finsch, Neu Guinea 1865, 175.

b. **Amadina pallida** *(1)* Gray, HL. II, 1870, 54, Nr. 6755; ?*(2)* Rosenb., Malay. Archip. 1878, 273.

Description. Wallace *1*; Sharpe *3*.

Adult. Head all round, neck and upper breast white, shaded with brown on neck and

breast; back and wings deep broccoli-brown, with slightly paler terminal edgings; rump and upper tail-coverts dark glossy maroon, the longest upper tail-coverts much lighter, under tail-coverts glossless maroon; lower breast, under wing-coverts, sides, flanks, abdomen, and thighs cinnamon-rufous (♂, Macassar, 15. VI. 95: Sarasin Coll.).

Another male is purer white on neck and jugulum.

Adult female. Like the male, but has the nape and the hind neck more strongly shaded with brown (♀, Macassar, 12. VII. 95, with nest and eggs: P. & F. S.).

Measurements.	Wing	Tail	Tarsus	Bill from nostril
a. (Sarasin Coll.) ♂ ad., Macassar, 3. VI. 95	50	36	15	8
b. (Sarasin Coll.) ♂ ad., Macassar, 15. VI. 95 . . .	53	35	15	8
c. (Sarasin Coll.) ♀ ad., Macassar, 12. VII. 95 . . .	53	34	15	8.5
d. (Sarasin Coll.) ♀ ad., Macassar, 15. VI. 95 . . .	53	35	15	8

Eggs. 5; ovate; white; rather thick-shelled; circa 15.5 × 12 mm (Macassar, 12. VII. 95: P. & F. Sarasin).

Nest. The nest, in which the above-mentioned eggs were found, was situated among shrubs. In shape a round oval, ca. 16 × 12 cm, the entrance at the side, rather large, diam 5 cm. It is built of pieces of flag-leaf, roots, stalks, and grass, the last forming the bulk of the material, and of it the entrance and interior are made (P. & F. S.).

Distribution. Lombok (Wallace *1, 3*, Doherty and Everett *5*); Flores (Wallace *3*); Celebes — South (Platen *2*, P. & F. Sarasin *4*, Everett *5*).

For a long time it was uncertain whether this *Munia* was really a Celebesian species. It was first mentioned as an inhabitant of the island by Finsch *(a 1)* and then by Gray *(b 1)*, but upon what evidence we do not know. Then Rosenberg, whose remarks relate principally to the Gorontalo District, recorded it as abundant, but he seems to have only taken the name from Gray, and it is probable that he had the common *Munia formosana* in view, a species he does not mention. Dr. Platen bought some living specimens of *M. pallida* at Macassar and believed from their cheapness that they were not imported. The first positive proof of its occurrence in a wild state in Celebes was provided by the Sarasins who found it near Macassar "everywhere in the rice-fields abundant with the Java Sparrow and other Munias". This was in June and July, when they obtained the above-described nest and eggs and four adults. Later in September they wrote: "The birds seem to be gone away again, at least we have not remarked any for a long time. At the time of the rice harvest they were in large numbers in Macassar". Mr. Everett, however, still got a female at Macassar and another at Bulekomba on the south coast after September 16th.

This species is easily distinguishable from the common Brown Munia, *M. formosana*, by its white or whitish head. The Celebesian *M. subcastanea* Hart. seems to be most nearly allied to it, but the chestnut under surface and rump of *M. subcastanea* present a striking difference.

* 227. MUNIA SUBCASTANEA Hart.

Doherty's White-headed Munia.

Munia subcastanea *(1)* Hart., Nov. Zool. 1897, 161.

Diagnosis. Like *M. pallida*, but the back and wings darker, hair-brown as against broccoli-brown; the under tail-coverts, concolorous with the lower breast, abdomen, sides, and thighs, dark hazel, much darker than the cinnamon-rufous of the body below of *Munia pallida*; rump hazel with a gloss of light sienna, uniform with the upper tail-coverts and outer edges of the rectrices: "iris dark brown; bill bluish grey, commissure and tip corneous": wing 51 mm; tail 39; tarsus 15; bill from nostril 7.5 (♂, type, Dongala, W. Celebes, Aug. 1896: Doherty in the Tring Museum).

"The skin marked '♀' is like those of the males, but the rump, upper tail-coverts, and edges of the central rectrices lighter and more yellowish" (Hartert).

Distribution. West Celebes — Dongala and Tawaya (Doherty).

The discovery of a new Munia in West Celebes with affinities to *M. pallida* of the South is certainly surprising. Mr. Doherty obtained three specimens only, one of which, the type, Mr. Rothschild has had the kind courtesy to lend us; from this it is easily seen that, though its affinites are with *M. pallida*, they are two well differentiated species.

228. MUNIA PUNCTULATA (L.).

Spotted Munia.

Dr. R. B. Sharpe (Cat. B. XIII, 346—354) recognises five races of this species, the form occurring in Celebes being:

Munia punctulata nisoria (Temm.).

Munia nisoria (Temm.) *(1)* Wald., Tr. Z. S. 1872, VIII, 73; *(2)* W. Blas., J. f. O. 1883, 132; *(3)* Sharpe, Cat. B., XIII, 1890, 353; *(4)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 13.

For further synonymy and references cf. Sharpe *3.*

Adult. Above broccoli-brown, the feathers with whitish shaft-lines, the terminal margins paler; upper tail-coverts ochraceous; tail greenish drab, greener on the middle feathers; face, ear-coverts, chin and throat umber-chestnut, the shafts paler on face and ear-coverts; under parts cream-white, not barred on the abdomen and thighs, only slightly so on the under tail-coverts, elsewhere marked with U-shaped bars of rufous brown; under wing-coverts buff; remiges below, where they rest upon the body, browner buff, elsewhere and tail below duller brown (♂, Macassar, July 1895: P. & F. Sarasin).

"Iris dark brown; feet blackish; maxilla black, mandible slate-colour" — Doherty, Lombok.

Female. Resembles the male (♀, Lake Posso, Centr. Cel., 15. II. 95: P. & F. S.).

Young. Without the chestnut face and throat and without bars on the under parts: above uniform broccoli-brown, tail washed with ochraceous; under parts pale isabelline, darker on the face and sides (♂ juv., Pare Pare, S. Cel., 1. VIII. 95: P. & F. S.).

Measurements. Wing 48—52 mm; tail c. 42; tarsus 14; middle toe and claw 18; bill from nostril 8.

Distribution. Malay Peninsula, Sumatra, Java, Bali (fide Sharpe *3*), Lombok (Vorderman, and Doherty, fide Hartert, Nov. Zool. 1896, 559), Sumba (Doherty ib. 582), Flores and Timor (Wallace *3*), Timorlaut (H. O. Forbes *3*); Celebes.

In Celebes — Macassar (Wallace *1*, *2*, *3*, P.& F. Sarasin *4*), Pare Pare, S. Cel. (iid.), Central Celebes (iid.).

There is a single specimen of this species in the Wallace Collection in the British Museum labelled "Macassar". It is mentioned by Lord Walden *(1)*, by Prof. W. Blasius *(2)* and by Dr. Sharpe *(3)*. *M. nisoria* had not been recorded from Celebes by any earlier or subsequent traveller, and neither the Leyden Museum (Büttik., Notes Leyd. Mus. 1892, XIV, 202), nor the Dresden, nor any other, so far as we are aware, possessed examples so labelled, until it was rediscovered in South and Central Celebes in 1895 by the Sarasins, whose collection contains four specimens. Blyth's remark (Ibis 1870, 172) that the race of *M. nisoria*, "from Celebes, has no pale shafts to the feathers of the upper parts" is incorrect. According to Dr. Sharpe, *M. nisoria* is one of five subspecies of which *M. punctulata* (Linn.) of the Indian countries is the type. Mr. Büttikofer (l. c.) makes the interesting statement that six specimens in the Leyden Museum from the island of Bourbon — where, as Dr. Hartlaub says (Vög. Madag. 1877, 403), the species has been introduced — "agree entirely with *M. nisoria* of Java, with the exception of the upper tail-coverts and centre tail-feathers, which are not ashy grey but sensibly tinged with pale olive-green, in which character they agree with *M. topela*. They are, however, undoubtedly to be united with *M. nisoria*". The example serves to illustrate our postulate (s. p. 162) that colonists become changed more than stayers-at-home.

229. MUNIA MOLUCCA (L.).

Moluccan Munia.

This species, which inhabits the Moluccas, the Celebesian area and the Lesser Sunda Islands, has developed differences, as shown by Dr. Sharpe *(c 1, e 1)* and afterwards by Mr. Büttikofer *(f 1)* in the Moluccas and in the Lesser Sunda Islands, while birds from Celebes are intermediate. The Lesser Sunda race has been separated, as a subspecies, *propinqua*, by Dr. Sharpe, who includes the Celebes birds under this title, while Mr. Büttikofer places the latter under *M. molucca typical*. Dr. Vorderman has separated the Kangean Munia subspecifically. We prefer, in want of a better method, to group them as follows:

1. The typical Munia molucca.

a. **Loxia molucca** *(1)* Linn., S. N. 1766, I, 302.

b. **Munia molucca** *(1)* Salvad., Orn. Pap. II, 1881, 434 (nec Celebes, Flores); *(2)* W. Blas. & Nehrk., Verh. z.-b. Ges. Wien 1882, 427; *(3)* Pleske, Bull. Ac. Sc. Petersb. 1884, 129; *(4)* Salvad., Orn. Pap. Agg. 1890, 139.

c. **Uroloncha molucca** *(1)* Sharpe, Cat. B., XIII, 1890, 367.

For synonymy and further references cf. Salvad. *b 1*; Sharpe *c 1*.

Figure and descriptions. Vieillot, Ois. Chant. 82, pl. 51 (1805 — *Loxia variegata*); Salvadori *b 1*; Sharpe *c 1*.

Diagnosis. Sides of breast below the black jugulum white, closely marked with vermiculate bars of black, like the rest of the under surface (Halmahera: Meyer — Nr. 2037).

Distribution. Moluccas — Batchian, Ternate, Halmahera, Buru, Amboina *(b 1)*; Ceram *(c 1)*; Kei Islands (Beccari *b 1*); ? Aru (Ribbe cf. Meyer, Z. f. g. Orn. 1884, 292).

2. Munia molucca propinqua Hart.

d. **Munia molucca** *(1)* Wall. (nec L.), P. Z. S. 1863, 486; *(2)* Wald., Tr. Z. S. VIII, 1872, 73 (Flores); *(3)* Meyer, Ztschr. ges. Orn. 1881, 768 (Timor); ?*(4)* Sclat., P. Z. S. 1883, 51, 195, 200 (Timorlaut); ? *(5)* H. O. Forbes, P. Z. S. 1884, 433 (Timorlaut).

e. **Uroloncha propinqua** *(1)* Sharpe, Cat. B., XIII, 1890, 368 (Flores).

f. **Munia propinqua** *(1)* Büttik., Notes Leyden Mus. 1892, 196 (Flores, Sumbawa, Timor); *(2)* id., Zool. Erg. Weber's Reise Ost-Ind. 1893, III, 303 (Flores).

g. **Munia molucca propinqua** *(1)* Hart., Nov. Zool. 1896, 568, 582.

Descriptions. Sharpe *e 1*, Büttik. *f 1*.

Diagnosis. Sides of breast below the black jugulum almost pure white; the vermiculate bars on the rest of the under surface thinner than in the typical form (Timor: Riedel — C 6202).

Distribution. Lesser Sunda Islands — Sumbawa *(f 1*, Doherty *g 1)*; Flores (Wallace *e 1*, Weber *f 2)*; Sumba (Doherty *g 1*); Timor (Riedel *d 3*, Mus. Leyd. *f 1*); Timorlaut (if identical — Forbes *d 4*).

3. Munia molucca — propinqua.

h. **Munia molucca** *(1)* Wall., Ibis 1860, 147; *(2)* Wald., Tr. Z. S. 1872, VIII, 73 (Cel.); *(3)* Meyer, Ibis 1879, 132; *(4)* W. Blas., J. f. O. 1883, 138; *(5)* Guillem., P. Z. S. 1885, 555; *(6)* W. Blas., Ornis 1888, 605 (Gt. Sangi); *(7)* Büttik., Notes Leyden Mus. 1892, 196; *(8)* id., Zool. Erg. Weber's Reise Ost.-Ind. 1893, III, 280; *(8)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 14; *(9)* iid., ib. 1896, Nr. 1, p. 13; *(10)* iid., ib. 1896, Nr. 2, p. 18; *(11)* Hart., Nov. Zool. 1897, 157.

i. **? Munia race,** Blyth, Ibis 1870, 172.

j. **Amadina molucca** *(1)* Brügg., Abh. Ver. Bremen V, 1876, 75; *(2)* Rosenb., Malay. Arch. 1878, 273.

k. **Munia malacca** *(1)* Joest (nec L.), Das Holontalo 1883, 105.

l. **Uroloncha propinqua** *(1)* Sharpe, Cat. B., XIII, 1890, 368 (Celebes).

m. **Spermestes variegata** (Vieill.) *(1)* Russ, Gefied. Welt 1879, 361, 371; *(2)* Meyer, l. c. remarks.

"Gotolo pinang", Banka, Nat. Coll.

"Hatalla", Gorontalo, Joest *k 1*, or **"Gadollo"**, Rosenb. *j 2*.

"Pelengek", Peling, Nat. Coll.

"Henggeng", Tagulandang and Siao, iid.

Diagnosis. Intermediate.

Distribution. We include the birds of the following localities under the above formula. Of course it should not be understood that we suppose them to be absolutely identical with one another. S. Celebes (Wall. *h 2*, *l 1*, Weber *h 7*, etc.); S. Central Cel. — Palopo (Weber *h 7*); N. Central Cel. — Mapane (P. & F. Sarasin *h 9*); Minahassa

(Meyer *h 3*, Fischer *j 1*); Gorontalo (Joest *k 1*); Banka (Nat. Coll.); Tagulandang and Siao (iid.); Gt. Sangi (Platen *h 6*); Peling (Nat. Coll. *h 10*); Sula Islands (Leyden Mus. *h 7*).

4. Munia molucca < propinqua.

o. **Munia molucca** *(1)* Hart., Nov. Zool. 1896, 168.

p. **Munia molucca propinqua** *(1)* Hart., Nov. Zool. 1896, 568, partim; *(2)* id., ib. 1897, 157, pt.

Diagnosis. Usually with the bars below slightly more obliterated than in Celebes examples, and thus standing nearer the form *propinqua* of the Lesser Sundas (♂ Kalao, Dec. 95: Everett — C 15150; ♀ Saleyer, Nov. 95: Everett — C 15151).

Distribution. Saleyer and Kalao (Everett *o 1*).

Observations. Mr. Hartert at first affirmed that the birds of Saleyer and Kalao "agree entirely with specimens from Celebes" *(o 1)*; then *(p 1)*, that "the specimens from Kalao must probably be considered to belong" to the subspecies *propinqua*; then again *(p 2)* he remarks: "Celebes examples are not, I think, separable from *M. molucca typica*, while some of the Saleyer and Kalao specimens approach the *M. molucca propinqua* of the Lesser Sunda Islands".

A nation is represented by its average individual, and we believe that the average Saleyer and Kalao Munia will be passably well represented by the formula *M. molucca < propinqua*, showing a nearer relationship to the Lesser Sunda birds than to the Moluccan ones.

5. Munia molucca > propinqua.

"Sario", Karkellang, Nat. Coll.

Diagnosis. The bars on the under surface slightly broader and blacker than in Celebes or Halmahera (4 examples from Karkellang, autumn, 1896).

Distribution. Talaut Is. — Karkellang (Nat. Coll.).

Remark. Here the formula employed is not strictly correct, for the Talaut birds seem to have the characters supposed to distinguish the Moluccan birds from those of the Lesser Sundas more strongly pronounced than in the typical form — at least than in that of Halmahera. The fault of the matter is that the extremes of racial differentiation are not yet known. Hartert speaks of Sumba birds as "very *typical propinqua*", meaning, perhaps, that the characters which Sharpe made a reason for separating the Flores birds by that name, are more highly developed in Sumba.

6. Munia molucca kangeanensis (Vorderm.).

q. **Uroloncha kangeanensis** *(1)* Vorderm., N. T. Ned. Ind. 1893, LII, 199.

Diagnosis. Like the Celebes form, but the breast and belly washed with an isabelline tint (? young), and the markings on the under parts finer (Vorderman).

Distribution. Kangean Islands.

The following is a general description of **the species:**

Adult. Sinciput and sides of head, chin, throat and jugulum black; upper-parts bistre-brown, duskier on the wing-coverts; rump white, with vermiculate bars of black; quills, tail and upper tail-coverts black; under-parts white, with vermiculate bars of black; under wing-coverts cinnamon-buff, quills below on inner web washed with the same colour. Iris brown; bill and feet bluish black (Guill. *h 5*);

lead-grey (Platen *h 6*). Wing 49 mm; tail 35; tarsus 14; bill from nostril 8 (ad. Siao, 24. VI. 93: Nat. Coll. — C 12625).

Sexes. Similar in coloration.

Young. Without the black head and throat of the adult; head above brown, darker than the back; sides of head and throat with dusky scale-bars; under-parts generally isabella-colour, with obscure U-shaped bars (Banka Id., 20. V. 94: Nat. Coll. — C 12145).

Eggs. "Uniform white, measuring 14 × 11.5 mm" (Nehrkorn MS.), or 14 × 10 (Ternate — Pleske *b 3*).

The typical M. molucca may be termed a more intensely coloured, and *M. molucca propinqua* a less intensely coloured form of the same bird. The small series in the Dresden Museum confirms Mr. Büttikofer's view that the birds of this species found in the Celebes area stand closer to the *typical* race than to that of the Lesser Sunda Islands.

As in other cases, it is not likely that the above formulae will be accepted without criticism, but we are not responsible for commencing the "splitting"; once begun, it is impossible to draw a boundary to stop at, and the use of signs is certainly better than names which may have no end. Philosophically viewed no two individuals are exactly alike, and it is not likely that the inhabitants of any two localities, when no communication between them is possible, are racially exactly alike either. In the face of such considerations the unreasoning use of trinomials is an utter failure. Mr. Hartert *(p 2)* in expressing his approval of Dr. Sharpe's denomination of the Lesser Sunda (properly the Flores) bird as *propinqua* — and Sharpe should know well what is most practical — remarks that "systematic work is scientific only if it is exact; if not it is either useless, or doing harm instead of good". The worst of it is, zoological nomenclature never is exact, nor can be; the name belongs to the type of the species only, and it is extended to other individuals "by courtesy", as one might say — because they can be conveniently grouped with the type by reason of their similarity or near consanguinity therewith, but to assume that they are exactly identical with it is something against all experience of the close observer. And what one worker finds practical another does not; he who has to determine thousands of skins will naturally find "splitting" less inconvenient that one who has to work with tens of thousands.

Little has been recorded about this species in a wild state, its habits, nesting, local movements, etc. Meyer met with it in large flocks near Manado in March; Guillemard found it near Kema in small flocks, feeding in the grass. It would seem to breed late in the year, or perhaps several times a year, as Fischer's eggs from Ternate were taken on the 20th October.

Munia molucca is a very distinct species. *M. acuticauda* Hodgs. of the Indian Region differs by having white shaft-streaks to the feathers of the upper surface, jugulum dark brown with U-shaped bars of whitish, under parts white with very obscure bars, rump almost pure white, tail more pointed, etc. This species is perhaps as nearly related to *M. molucca* as any one.

FAMILY FRINGILLIDAE.

The Finches and Buntings are seed- and fruit-eating (except as nestlings) *Passeres* with nine primaries; this should serve to distinguish them from the Munias, which they resemble in other respects. For further particulars see Sharpe (Cat. of Birds XII, 1888, pp. 1—6, 168—169, 468—472), who recognises three subfamilies, the *Coccothraustinae* typified by the Hawfinch, the *Fringillinae* by the Chaffinch, and the *Emberizinae* by the Yellow Hammer.

It is highly remarkable that not a single member of this enormous family is known from Australia, Papuasia, the Moluccas, or Borneo, and it is represented in Celebes only by *Passer montanus*, which is no doubt a recent colonist in the town of Macassar.

GENUS PASSER Briss., Pall.

The Sparrows have the bill scarcely as long as the cranium, conical, very slightly denticulated, the nostril at the base of the maxilla, nearly concealed by the frontal feathers; a few small rictal bristles. The first three primaries longest; tail square; middle toe with claw slightly longer than the tarsus.

Range: the Old World as far as Celebes.

230. PASSER MONTANUS (L.).

Tree Sparrow.

Passer montanus (Linn.), *(1)* Vorderm., N. T. Ned. Ind. 1882, XLII, 82; *(2)* id., ib. 1885, XLV, 395; *(3)* Sharpe, Cat. B. 1888, XII, 301; *(4)* Oates, Faun. Br. Ind. B. II, 1890, 240; *(5)* id., ed. Hume's Nests & Eggs Ind. B. 1890, II, 162; *(6)* Seeb., B. Japan 1890, 130; *(7)* Tacz., Faun. Orn. Sib. Orient. I, 1891, 617; *(8)* Bourns & Worces., B. Menage Exp. 1894, 37; *(9)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 13.

a. **Passer monticola** *(1)* Steere, List Coll. B. & M. Philipp. Is. 1890, 23.

For further synonymy and references, figures and descriptions see the standard works on the birds of European countries; Sharpe *3*; Oates *4*; Taczanowski *7*; etc.

Adult. Above rufous brown, the head walnut-brown; mantle striped with black; wings blackish, externally like the back, the middle and greater coverts tipped with white or whitish, forming two bars; rectrices dull brown with pale edges; a patch on the ear-coverts, subocular streak, lores and region at base of mandible, chin, middle of throat and jugulum black; rest of face and sides of throat and of neck whitish, becoming whitish drab on breast and abdomen, more rufous on sides, flanks and thighs, inclining to cinnamon on under wing- and tail-coverts, the last with darker centres (♂, Macassar town, July 1895: P. & F. Sarasin).

Female. Like the male.

Measurements (2 males: Macassar). Wing 68, 69 mm; tail 53, 54; tarsus 16.5, 17; bill from nostril 8.

Nest and eggs. See Hume *5*, Taczanowski *7*, and writers on European birds.

Distribution. "The greater part of Europe, local in many places; eastward to Siberia, to Japan and China; N. E. Africa; Central Asia, Persia, and Afghanistan; the Himalaya Mountains eastward to Assam, Burmah, and through Tenasserim and the Malay Peninsula to Java" (Sharpe *3*).

In the East Indies: Singapore (Davison *3*); Sumatra (Hagen); Java (Vorderman *1*, *2*); South Celebes — Macassar (P. & F. Sarasin *9*); Philippines — Luzon (Steere *a 1*), Cebu (Bourns & Worcester *8*).

The first record of the occurrence of the Tree Sparrow in Celebes is due to the Sarasins, who obtained two males in the town of Macassar in July, 1895. The bill of these specimens is entirely black, whereas in European examples it is yellow at the base. In Europe the Tree Sparrow breeds in holes in trees and resorts to the open country; in the East it is partial to the towns and makes its nest by preference in holes in houses, so replacing the House Sparrow in these parts. At Batavia, according to Dr. Vorderman, it is the commonest bird, and does much harm there by pecking holes in the plaster walls of houses, owing to which and to the heavy rains he has even seen houses reduced to ruins.

FAMILY STURNIDAE.

The Starling-family may be distinguished from the *Timeliidae* by the comparatively long wing; from the *Corvidae* by the absence of projecting bristles covering the nostrils (though the nostrils are sometimes hidden by the projecting frontal plumes) and generally by their smaller size; from the *Turdidae* by the tarsus scutellated anteriorly from top to bottom. The first primary is minute, the second reaches nearly or quite to the tip of the wing. Many of the species are gregarious, noisy, of excellent flying-powers; sometimes migratory.

GENUS CALORNIS G. R. Gray.

Plumage with a strong metallic gloss, sexes similar; young streaked below and not metallic. Arboreal; gregarious. Culmen about as long as the cranium, its keel high, decurved; nostril small, roundish, exposed; wing long, the secondaries about $^2/_3$ its length, 1st primary minute, tip of wing formed by 2nd—4th. Tarsus short, shorter than middle toe and claw, like the feet black in colour. Tail rounded or graduated, varying much in length according to the species. The genus belongs to the Indo-Australian area.

231. CALORNIS PANAYENSIS (Scop.).

Philippine Glossy Starling.

Of this species five races have been recognised by Dr. Sharpe (Cat. B. XIII, 1890, 143—148), who, however, wrongly takes the form found from Java

to India, *C. chalybea* (Horsf.), as the type, whereas the Philippine form received its name from Scopoli 37 years earlier. In this article seven races are treated of. After very carefully comparing a series of adults from the Philippines and the Northern Peninsula of Celebes, we find ourselves unable to make out any differences between the birds from the latter locality, hitherto known as *C. neglecta*, Wald., and *the typical panayensis* of the Philippines; these birds we therefore unite. On the other hand it is clear from Sharpe's investigations that racial differences are prominent in birds from N. W. India (*C. affinis* A. Hay); yet Dr. Sharpe does not consider it advisable, or indeed possible, to distinguish this deviation by name from *C. p. chalybea* of Java, Borneo, Sumatra and Malacca, because "Tenasserim specimens are thoroughly intermediate, and it is impossible to find where the range of either form ends in the Burmese provinces".

In a more striking manner the Sangi race, hitherto known as *C. sangirensis* Salvad., intergrades with birds from the mainland of Celebes, the intermediate forms being furnished by the islands off the Minahassa and those midway between Celebes and Sangi.

We therefore find it more convenient to treat of this wide-spread form in the following way:

1. The typical Calornis panayensis.

a. **Le petit Merle** ou **Musicien de l'isle de Panay** *(I)* Sonn., Voy. N. Guin. 1776, 115, pl. 73.

b. **Muscicapa panayensis** *(1)* Scop., Del. Flor. et Faun. Insubr. 1783, II, 96; *(2)* Wald., Tr. Z. S. VIII, 1872, 79.

c. **Turdus cantor** *(1)* Gm., S. N. 1788, I, 837; *(II)* Kittl., Kupfert. Vög. 1832, II, 11, pl. 5, fig. 1.

d. **Calornis panayensis** *(1)* Gray, HL. II, 1870, 26, Nr. 6373; *(2)* Wald., Ibis 1872, 97; *(3)* id., Tr. Z. S. IX, 1875, 205, 251; *(4)* Sharpe, Ibis 1876, 46; *(5)* Tweedd., P. Z. S. 1877, 549, 763, 831; *(6)* id., ib. 1878, 113, 343, 710; *(7)* id., ib. 1879, 72; *(8)* Sharpe, Tr. L. S. 1879, (2) I, 343, 353; *(9)* Wardl. Rams., Tweedd. Orn. Works 1881, 658; *(10)* A. Müll., J. f. O. 1882, 288; *(11)* Sharpe, Ibis 1884, 321; *(12)* Wardl. Rams., Ibis 1886, 162; *(13)* Sharpe, Ibis 1888, 202; *(14)* W. Blas., Ornis 1888, 315; *(15)* Everett, J. Str. Br. R. A. S. 1889, 144; *(16)* Steere, List Coll. B. & M. Philipp. Is. 1890, 23; *(17)* Whitehd., Ibis 1890, 56; *(18)* Sharpe, Cat. B. XIII, 1890, 149; *(19)* Hartert, J. f. O. 1891, 203; *(20)* Sharpe, Ibis 1894, 250, 257; *(21)* Bourns & Worces., B. Menage Exp. 1894, 37; *(22)* Everett, Ibis 1895, 27, 36; *(23)* Grant, t. c. 260, 456; *(24)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 14.

e. **Calornis neglecta** *(1)* Wald., Tr. Z. S. VIII, 1872, 79, 113 (nec Sula); *(2)* Meyer, J. f. O. 1873, 405; *(3)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 668; *(4)* Walden, Tr. Z. S. 1875, IX, 205; *(5)* Brügg., Abh. Ver. Bremen 1876, V, 78; *(6)* Sharpe, Ibis 1876, 46, partim (nec Sula); *(7)* Lenz, J. f. O. 1877, 376; *(8)* Meyer, Ibis 1879, 134, 145; *(9)* id., Isis, Dresden 1884, 48; *(10)* Guillem., P. Z. S. 1885, 556; *(11)* W. Blas., Zt. ges. Orn. 1886, 124; *(XII)* Meyer, Vogelskel. 1886, I, pl. XCIV; *(13)* Hickson, Nat. in N. Celebes 1889, 92, pt.; *(14)* Sharpe, Cat. B. XIII, 1890, 148.

f. **Calornis metallicus** *(1)* Rosenb. (nec Temm.), Malay. Archip. 1878, 273.

"Sië" (Meyer *e 8*) or **"Sije itam"**, Malay, Celebes (Nat. Coll.).

"Tanggo-lippo", Celebes, Rosenb. *f 1.*

For further synonymy and references cf. Sharpe *d 18.*

Figures and descriptions. Kittlitz *c II*; Meyer *e XII* (skeleton); Walden *e 1*; Brüggemann *e 5*; Sharpe *d 18.*

Diagnosis of adult. Size large (wing 102—114 in 24 adults from Celebes and the Philippines); coppery-green tints strongly expressed (in two-thirds of the specimens being stronger than in adults from Java).

Distribution. Philippine Islands — throughout *(d 3, d 8, d 9, d 12, d 16)* incl. Sooloo (Everett *d 20*); Northern Peninsula of Celebes (Meyer *e 2, e 8*, Fischer *e 5* etc.); Talissi Id. (Guillemard *e 10*, Hickson *e 13*); Manado tua, Mantehage and Banka (Nat. Coll.); Togian (Meyer *e 8*).

2. Calornis panayensis chalybea (Horsf.).

g. **Turdus chalybeus** *(1)* Horsf., Tr. L. S. XIII, 1821, 148.

h. **Calornis cantor** *(1)* Blyth, J. A. S. B. XIII, 1844, 366.

i. **Calornis chalybea** (or **chalybeus**) *(1)* Horsf. & Moore, Cat. B. Mus. E. I. Co. 1856, II, 543; *(2)* Salvad., Cat. Ucc. Borneo 1874, 271; *(3)* Kelham, Ibis 1881, 143; *(4)* A. Müll., J. f. O. 1882, 387, pt.; *(5)* Büttik., Notes Leyd. Mus. IX, 1887, 71; *(6)* Everett, J. Str. Br. R. A. S. 1889, 143; *(7)* Oates, ed. Hume's Nests & Eggs Ind. B., I, 1889, 367, pt.; *(8)* id., Faun. Br. Ind. B., I, 1889, 514, pt.; *(9)* Hartert, J. f. O. 1889, 355; *(10)* Sharpe, Cat. B. XIII, 1890, 143, pt.; *(11)* Vorderman, N. T. Ned. Ind. 1891, L, 497; *(12)* id., Notes Leyden Mus. 1891, XIII, 128; *(13)* Salvad., Ann. Mus. Civ. Gen. 1891, 71; *(14)* Hose, Ibis 1892, 402.

For further synonymy cf. Salvad. *i 2.*

Description. Sharpe *i 10.*

Diagnosis. Size small (wing 94—101 in four adults from Java), plumage duller, with less of coppery-green.

Distribution. Java (Horsfield *g 1, i 10*, etc.); Billiton (Vorderman *i 11, i 12*); Borneo (Mottley etc. *i 2, i 6*); Sumatra (Raffles etc. *i 2, i 10*); Singapore (Davison *i 10*, Kelham *i 3*); Malay Peninsula (Cantor, etc. *i 2, i 4, i 10*).

3. Calornis panayensis affinis (Hay).

j. "**Calornis affinis** (A. Hay)" *(1)* Blyth, J. A. S. B. XIII, 1844, 366; *(2)* Hume, Str. F. 1877, 38; *(3)* Sharpe, Cat. B. XIII, 1890, 144.

k. **Calornis chalybea** *(1)* Oates, B. Br. Burmah 1883, I, 390, pt.; *(2)* id. *i 7*, pt.; *(3)* id. *i 8*, pt.; *(4)* Sharpe *i 10*, pt.

For further references cf. Sharpe *i 10.*

Description. Sharpe *i 10.*

Diagnosis. Size large (wing 106—109 mm); always with a more or less distinct bronzy purple gloss on the under-parts (Sharpe *i 10*).

Distribution. N. W. India — Tipperah, Dacca, Cachar *(i 8, i 10)*.

Calornis panayensis chalybea — affinis.

l. **Calornis chalybea** *(1)* Hume & Davison, Str. F. VI, 1878, 394; *(2)* Oates, B. Br. Burmah 1883, I, 390, pt.; *(3)* id. *i 7, i 8*, pt.; *(4)* Sharpe *i 10*, pt.

Description. Hume and Davison *l 1.*

Diagnosis. Intermediate between the subspecies 2 and 3.

Distribution. The Burmese countries *(l 1, i 10)*.

4. Calornis panayensis tytleri (Hume).

m. **Calornis tytleri** *(1)* Hume, Str. F. I, 1873, 480; *(2)* id., ib. II, 1874, 253; *(3)* Sharpe, Cat. B. XIII, 1890, 146, subsp.

For further references cf. Sharpe *m 3.*

Descriptions. Hume *m 1*, Sharpe *m 3.*

Diagnosis. Size large (wing 106—120 mm), plumage darker and more sombre, with a dark metallic green gloss (Hume *m 1*). Irides in adults "white, opalescent white, fleshy white, pale pink, brown, deep brown, deep red-brown and deep orange", — in adults of the other forms the eyes are commonly said to be crimson.

Distribution. Andaman and Nicobar Islands (Davison etc. *m 1*, *m 2*, *m 3*).

5. Calornis panayensis sangirensis (Salvad.).

n. **Calornis sanghirensis** *(1)* Salvad., Ann. Mus. Civ. Gen. IX, 1876, 60; *(2)* Meyer, Isis, Dresden 1884, 6, 48; *(3)* W. Blas., Ornis 1888, 606, 642; *(4)* Hickson, Nat. in N. Celebes 1889, 191; *(5)* Sharpe, Cat. B. XIII, 1890, 149; *(6)* M. & Wg., J. f. O. 1894, 247; *(7)* iid., Abh. Mus. Dresd. 1895, Nr. 9, p. 6.

o. **Calornis neglecta** pt. *(1)* Hickson, Nat. in N. Celebes 1889, 92.

"Singgalore maitung" ad., Great Sangi and Siao, Nat. Coll.

"Singgalore mawira" juv., Great Sangi, Nat. Coll.

"Singgalore bungiung" juv., Siao, Nat. Coll.

"Sanggeloka", Talaut Is., Nat. Coll.

Diagnosis. Like *C. panayensis* of North Celebes, but much larger, and with a relatively larger bill (Great Sangi, Nat. Coll. — C 12685, etc.). Bill and feet black, iris blood-red (Platen *n 3*).

Measurements (18 adult examples from Gt. Sangi, Siao, and Talaut). Wing 113—124 mm; bill from nostril 15—18.5.

Sexual differences of coloration are not known to exist. Dr. Platen's hunters indicated five specimens in the above plumage as males, and five in the striped plumage of the young as females, but in allied forms the sexes are known to be similar and such no doubt is the case in this bird also.

Eggs. Some broken fragments in a nest obtained by our collectors show that the eggs of this species resemble those of the *typical C. panayensis* and *C. metallica*, viz: ground-colour bluish white, with scanty spots of lilac and blackish brown.

Nest. Long oval, or, better, fusiform; about 350 × 150 mm, a cup-shaped hole in the widest part, about 70 mm across by 60 deep. A rather loose structure of bits of stick, stalks and tendrils of climbing-plants (Great Sangi or Siao: Nat. Coll. — C 12538 and others).

Distribution. Sangi and Talaut: — Siao (Meyer *n 2*, Nat. Coll.), Great Sangi (Bruijn *n 1*, Meyer *n 2*, Platen *n 3*, Nat. Coll.), Karkellang, Kabruang and Salibabu (Nat. Coll. *n 6*, *n 7*), Nanusa — if identical (Hickson *o 1*).

Calornis panayensis — sangirensis.

Diagnosis. Intermediate between the Celebes-Philippine birds and those of Sangi-Talaut.

Measurements. (9 adult examples). Wing 112—121 mm; bill from nostril 15—16.5. See also measurements below.

Distribution. Tagulandang, Ruang, and Biarro, between North Celebes and Sangi (Nat. Coll.).

Observation. Large specimens from the islands off the north coast of Celebes, Manado tua and Lembeh, afford further gradations to the ordinary *C. panayensis.*

6. Calornis panayensis altirostris (Salvad.).

p. **Calornis altirostris** *(1)* Salvad., Ann. Mus. Civ. Gen. (2) IV, (1886) 1887, 553; *(2)* Sharpe, Cat. B. XIII, 1890, 147.

Description. Salvad. *p 1.*

Diagnosis. Like *C. panayensis chalybea*, but darker, larger (wing 105 mm), and with a very stout and much higher bill (Salvad.).

Remark. Dr. Sharpe remarks that this bird should be carefully compared with *C. panayensis tytleri*. From Count Salvadori's description it seems to be smaller and to have a differently-shaped bill, the last not being, as we should think, a very stable character, judging from its variation in *Calornis panayensis sangirensis*.

Distribution. Nias Island off Sumatra (Modigl.).

7. Calornis panayensis enganensis (Salvad.).

q. **Calornis enganensis** *(1)* Salvad., Ann. Mus. Civ. Gen. (2) XII, 1892, 137.

Diagnosis. Like *C. panayensis chalybea*, but larger, with longer wings (115 mm), stouter bill [and when young not white below, striped with dusky, but entirely black]. If the young of this race differ from those of the others in being always black, specific distinction must of course be admitted.

Distribution. Engano Island, Sumatra (Modigliani).

The species.

Calornis panayensis as a Celebesian species may be described as follows:

Adult. Entirely metallic coppery green on a black ground; quills and tail black, externally shaded with green except on the primaries; lores and base of the forehead velvety and black; the feathers of the head, neck, and throat hackle-shaped (♂, Tomohon, N. Celebes, 25. III. 94, P. & F. Sarasin).

Female. Like the male, but the hackle-feathers seem to be less developed. Iris red (♀, Kema, 27. X. 93: P. & F. Sarasin).

Young. Dusky, darker on the head; the feathers with obscure paler margins; below white, striped with dusky like the back (Minahassa: Faber — C 3509). Iris yellow, orange or pink, increasing, apparently, in intensity to deep red in the fully adult bird (Kelham *i 3*).

Immature. The young in its second plumage is like the adult above — glossy green on a black ground; below white, or yellowish white, striped with glossy greenish black like the back (Mantehage Id., 21. IV. 93: Nat. Coll. — C 12188).

Measurements (adult specimens from the Celebesian subregion).	Wing	Tail	Tarsus	Bill from nostril
a. (C 2435) ♀ ad., N. Celebes, Limbotto, VII. 71 (Meyer)	103	71	22	13
b. (Sarasin Coll.) ♀ ad., N. Cel., Kema, 27. X. 93 . .	105	69	23	13.5
c. (Sarasin Coll.) ♂ ad., N. Cel., Tomohon, 25. III. 94 .	109	74	22.5	14.5
d. (C 15643) ad., N. Celebes (Riedel)	108	69	23.5	13.5
e. (C 2425) ad., Manado, III. 71 (Meyer)	110	74	22	12.5
f. (C 5220) ad., Manado, (v. Musschenbroek)	109	74	23	13
g. (C 12181) ad., Banka Id., 14. V. 93 (Nat. Coll.) . .	108	71	23	13.5
h. (C 12183) ad., Banka Id., 12. V. 93 (iid.)	111	76	24	13.8
i. (C 12192) ad., Manado tua Id., 8. IV. 93 (iid.) . . .	109	76	23	13.8
j. (C 12186) ad., Manado tua Id., 8. IV. 93 (iid.) . . .	111	74	24	14.8

Measurements (continued).	Wing	Tail	Tarsus	Bill from nostril
k. (C 12182) ad., Mantehage Id., 22. IV. 93 (Nat. Coll.)	109	76	24.5	14.5
l. (C 12185) ad., Mantehage Id., 22. IV. 93 (iid.) . . .	111	80	23	14.5
m. (C 13512) ad., Biarro Id., 3. IX. 94 (iid.)	116	81	24.5	14.8
n. (C 13506) ad., Tagulandang Id., 3. VIII. 94 (iid.) . .	112	77	24	15
o. (Tring Mus.) ad., Tagulandang Id., 5. VIII. 94 (iid.)	113	79	23	16
p. (Tring Mus.) ad., Tagulandang Id., 9. VIII. 94 (iid.)	116	—	24.5	15.7
q. (C 13507) ad., Tagulandang Id., 7. VIII. 94 (iid.) . .	116	81	24.5	16.5
r. (C 13509) ad., Ruang Id., 28. VIII. 94 (iid.) . . .	110	80	23.5	15
s. (Tring Mus.) ad., Ruang Id., 23. VIII. 94 (iid.) . .	115	83	23.5	15.7
t. (Tring Mus.) ad., Ruang Id., 30. VIII. 94 (iid.) . .	121	81	25.5	16.5
u. (C 13511) ad., Ruang Id., 21. VIII. 94 (iid.)	117	80	24.5	15.5
v. (C 2444) ad., Siao (Meyer)	119	87	25.5	16
w. (C 2448) ad., Siao (Meyer)	116	82	25	16
x. (C 12604) ad., Siao, 23. VI. 93 (Nat. Coll.) . . .	117	83	25	16.5
y. (C 12605) ad., Siao, 29. VI. 93 (iid.)	118	83	26	17
z. (C 12684) ad., Gt. Sangi, 28. VII. 93 (iid.)	121	83	25	16.5
a'. (C 12685) ad., Gt. Sangi, 21. VII. 93 (iid.)	117	80	26	16
b'. (C 13126) ad., Kabruang, 11. XI. 93 (iid.)	117	82	25	17
c'. (C 13128) ad, Kabruang, 14. XI. 93 (iid.)	117	81	25.5	16
d'. (C 13127) ad., Kabruang, 14. XI. 93 (iid.)	121	82	25	17
e'. (C 13131) ad., Kabruang, 14. XI. 93 (iid.)	121	84	25	17
f'. (C 13130) ad., Kabruang, 11. XI. 93 (iid.)	119	85	26	17.7
g'. (C 13129) ad., Kabruang, 11. XI. 93 (iid.)	117	78	24	15.5
h'. (C 13132) ad., Salibabu, 29. X. 93 (iid.)	123	83	26	18

Skeleton (Meyer *e XII*).

Length of cranium . . .	46.0 mm	Length of tibia	38.0 mm
Greatest breadth of cranium	19.2 »	Length of tarso-metatarsus	23.0 »
Length of humerus . . .	26.5 »	Length of sternum . . .	29.0 »
Length of ulna	30.0 »	Greatest breadth of sternum	20.0 »
Length of radius	26.5 »	Height of crista sterni . .	8.0 »
Length of manus	30.0 »	Length of pelvis	32.0 »
Length of femur	25.0 »	Greatest breadth of pelvis	21.0 »

Eggs. Very pale greenish blue, with a number of large and smaller spots and blotches, brownish-reddish purple and paler greyer purple, sometimes almost black; moderately broad ovals, more or less compressed towards the small end; size 25.4 × 18.8 mm (Malay Peninsula, and elsewhere? Hume *i 7*).

Nest. Built in holes in trees or at the juncture of palm-leaves with the trunk; very high up *(i 3)*; a loose structure almost globular, but open at the top, of very coarse dry grass (lallung or elephant-grass), lined with green durian leaves cut into small bits (Malay Peninsula, Davison *i 7*).

Remark. The nesting habits of *C. panayensis enganensis*, the young of which are said to be black, might be observed with advantage.

In his Malay Archipelago, 1869, I, 431, Mr. Wallace speaks of *Calornis* as a form absent from Celebes. The present species is now known as one of the commonest birds in North Celebes, but it has not yet occurred, to our

knowledge, in the south, where it seems to be represented by *Calornis minor*. This is suggestive, in the case of a bird of such excellent flying-powers, of recent immigration into the country, a view which is confirmed by the complete, or almost complete, identity of the birds in the Northern Peninsula with Philippine ones, and in the Southern Peninsula with the Lesser Sunda species; it is pretty certain, however, that Mr. Wallace did not have the good fortune to come across the bird during the months of June to September owing perhaps to its local movements, though we received it from Manado in August and September.

Where this species, or its allies, occur on small islands, they are always larger in size than on the neighbouring mainland, as shown by *C. panayensis tytleri*, *altirostris*, *enganensis*, *sangirensis*.

The Glossy Starling is, as Hickson remarks, the commonest bird met with throughout the islands which lie between Celebes and the Philippines, — viz. Biarro, Ruang, Tagulandang, Siao, Sangi, Talaut, and the Nanusa Islands. In colour these birds do not differ from the Celebes race, but the Sangi and Talaut birds are always bigger, yet, as shown by the above table of measurements, every transition is found on the islands between Great Sangi and North Celebes. Considerable individual variation in the important character of size occurs, as will be seen on comparing the measurements of specimens *r* and *t* from the same locality, Ruang, or *f'* and *g'* from Kabruang.

The peculiar insular avian forms of the Sangi and Talaut Islands are commonly larger than those of the mainland of Celebes, and we know of no case of a local race being smaller in Sangi or Talaut than in Celebes. *C. panayensis sangirensis* follows the rule. Other examples of this increase of size on the Sangi and Talaut Islands are afforded by *Tanygnathus muelleri sangirensis*, *Ceycopsis sangirensis*, *Cittura sangirensis*, *Dicaeum sangirense* and *talautense*, *Acmonorhynchus sangirensis*, *Anthreptes malaccensis chlorigaster*, *Zosterops nehrkorni*, *Oriolus formosus* and *melanisticus*.

Nothing is easier than to suggest explanations how this condition of increased size in the insular forms came about; for instance, Birds-of-prey are scarce in the islands, and among many birds the males are supposed to be more numerous than the females[1]), consequently the stouter males will secure partners, the weaker not; while on the mainland Birds-of-prey are plentiful, and small individuals (in our own kind at least) are quicker-witted and know how to look after themselves better than big ones, and these will be they which will best avoid the dangers which surround them; but there hardly seems to be a means as yet known of ascertaining what is the correct explanation.

In its habits the Glossy Starling is said to resemble the Common Starling of Europe, except that it is rarely or never seen on the ground. It flies and

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[1]) We should be sorry to commit ourselves to this theory with its present shaky basis of proof.

roosts in large flocks, feeds on berries and, as Davison says, insects; in the stomach of a specimen killed by the Drs. Sarasin at Kema were the pits of a fruit called "Bua kaju". Its cry is described as a single metallic note.

232. CALORNIS MINOR (Bp.).

Timor Glossy Starling.

a. **Lamprotornis minor** *(1)* Bp., Consp. Av. 1850, I, 417; *(2)* Finsch, Neu-Guinea 1865, 174.
Calornis minor *(1)* Wall., P. Z. S. 1863, 486; *(2)* Gray, HL. II, 1870, 26, Nr. 6375; *(3)* Wald., Tr. Z. S. 1872, VIII, 80; *(4)* Sharpe, Ibis 1876, 48; *(5)* Meyer, Verh. z.-b. Ges. Wien 1881, 766; *(6)* id., Isis, Dresden 1884, 48; *(7)* Guillem., P. Z. S. 1885, 509; *(8)* Sharpe, Cat. B. XIII, 1890, 142; *(9)* Büttik., Notes Leyden Mus. XIV, 1892, 201; *(10)* Meyer, t. c. 265; *(11)* Büttik., Zool. Erg. Weber's Reise Ost-Ind. 1893, III, 280; *(12)* Tristr., Ibis 1895, 375; *(13)* Vorderm., N. T. Ned. Ind. 1895, LIV, 348; *(14)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 4; *(15)* Hart., Nov. Zool. 1896, 154, 168, 559, 568, 580, 583, 594.

Description. Sharpe *8*.

Adult male. Coppery green on a black ground; neck and jugulum dark auricula-purple; quills and tail-feathers black with a green gloss on the tail and a blue one on wings. "Iris light red; bill and feet black." Wing 106 mm, tail 70, tarsus 19.5, bill from nostril 11 mm (♂, Bonthain, S. Celebes: Ribbe & Kühn — Nr. 13556).

Adult female. Similar to the male in colour, but with a slight purplish gloss on the head (Sharpe *8*).

Young. Browner than the adults, with a slight green gloss; below dull white, with broad blackish streaks; sides of body uniform dull brown; iris red (Sharpe *8*).

Observation. The tail is not graduated but square in shape.

Distribution. Lombok (Wallace *1*, *8*, etc. *13*, *15*); Sumbawa (Guillemard 7, Doherty *15*); Sumba (Riedel *5*, *10*, ten Kate *9*, Doherty *15*); Flores (Wallace *1*, *8*); Timor (Mus. Leyden *a 1*, Wallace *1*, *8*, Mus. Dresd. *6*); South Celebes (Ribbe & Kühn *6*, Weber *11*, etc. *14*, *15*).

This species, a native of the Lesser Sunda Islands, has been obtained by Ribbe & Kühn, Weber, the Sarasins, and Everett in the extreme south of South Celebes, but nowhere else at present in the island. It may be distinguished from *C. panayensis* of the Northern Peninsula by the dark purple of the hackle-feathers of the throat, sides of neck and (to some extent) hind neck, by its smaller bill and shorter tarsus. From *C. metallica* it differs by the different green of its plumage, the absence of purple on the mantle, its short square tail and smaller size. Once, again, this bird exemplifies the rule that Lesser Sundan forms predominate in South Celebes, not in the North.

* 233. CALORNIS SULAENSIS Sharpe.

Sula Glossy Starling.

Plate XXXVI.

a. **Calornis obscura** var. *(1)* Wall., P. Z. S. 1862, 343.
b. **Lamprotornis obscurus** pt. *(1)* Finsch, Neu-Guinea 1865, 174 (Sula).

c. **Calornis neglecta** pt. *(1)* Wald, Tr. Z. S. VIII, 1872, 79 (Sula); *(2)* Sharpe, Ibis 1876, 46 (Sula).

d. **Calornis obscura** pt. *(1)* Salvad., Orn. Pap. II, 1881, 454.

Calornis sulaensis *(1)* Sharpe, Cat. B. XIII, 1890, 149; *(2)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 2, p. 18.

"Salinggoka mopo", Tonkean and Balante, East Celebes, Nat. Coll.

"Kuling", Peling and Banggai, iid.

Description. Sharpe *1.*

Diagnosis. In colour like *C. panayensis* of Celebes, but slightly duller and less coppery; differs chiefly by having the tail much longer and strongly graduated, the outermost pair of rectrices about 25—30 mm shorter than the middle ones, and the supraloral and post-nasal feathers smooth, not disintegrated and velvety (ad. Peling — C 14550, and others).

Measurements (8 adults, Peling, Banggai, and E. Celebes). Wing 106—112 mm; tail 90—96; tarsus c. 24; bill from nostril 13.5—15.

Young. Like the young of *C. panayensis*, but is distinguishable by its smooth post-nasal feathers and long graduated tail (Tonkean — C 14431, and others).

Distribution. Sula Islands (Allen *a 1*); Banggai, Peling, and East Celebes (Nat. Coll.).

A fine series of this well characterized species were collected by our native hunters in Peling and Banggai, and also in East Celebes, where *C. panayensis* was not obtained. Celebes thus appears to have been invaded by Glossy Starlings at three different points — by *C. minor* of the Lesser Sunda Islands in the South, by *C. panayensis* of the Philippines in the North, and by *C. sulaensis* in the East. By the shape of its tail and by its not having the supraloral feathers disintegrated *Calornis sulaensis* betrays its affinities with *C. metallica* and with *C. circumscripta* of Timorlaut, but it is easily distinguishable by the absence of purple on the mantle, head, and throat, and by the middle rectrices less prolonged, as also by the less bronzy hue of its plumage.

234. CALORNIS METALLICA (Temm.).

Australian Glossy Starling.

a. **Lamprotornis metallica** *(1)* Temm., Pl. Col. II, pl. 266 (1824); *(2)* Finsch, Neu-Guinea 1866, 174.

b. **Stourne bronzé** *(1)* Hombr. & Jacq., Voy. Pôle Sud, Atl. pl. 16, f. 2 (1832—35).

c. **Aplonis metallica** *(1)* Gld., B. Austr. Suppl. 1851, pl. 33.

Calornis metallica *(1)* Gray, Gen. B. II, 327 (1846); *(2)* Wall., P. Z. S. 1862, 335, 343; *(3)* Gld., Hand-b. B. Austr. 1865, I, 477; *(4)* Wald., Tr. Z. S. VIII, 1872, 80; *(5)* Rams., P. Z. S. 1875, 593; *(6)* Brügg., Abh. Ver. Bremen 1876, V, 78, 100; *(7)* Salvad., Orn. Pap. II. 1881, 447; *(8)* W. Blas., J. f. O. 1883, 120, 126, 159; *(9)* Meyer, Isis, Dresden 1884, 48; *(10)* Ramsay, Tab. List 1888, 12; *(11)* North, Nests and Eggs B. Austr. 1889, 190; *(12)* Sharpe, Cat. B. XIII, 1890, 138; *(13)* Salvad., Orn. Pap. Agg. 1890, 141; *(14)* Meyer, Ibis 1890, 417; *(15)* Hartert, Kat. V. Senckenb. Mus. 1891, 75; *(16)* id., Nov. Zool. 1896, 13, 235; *(17)* Salvad., Ann. Mus. Civ. Gen. 1896, (2) XVI, 102.

For further synonymy and references cf. Salvad. *7, 13*; Sharpe *12.*

Figures and descriptions. Temminck *a I*; Hombron & Jacquinot *b I*; Gould *c I, 3*; Salvadori *7*, Sharpe *12*.

Adult. Black, glossed with metallic green: quills and tail more dusky; head above, mantle and jugulum glossed with auricula-purple, the middle of the mantle with green; cervical collar glossed with metallic green, like the remaining upper- and under-parts; wing 104 mm; tail 94; tarsus 21; bill from nostril 12 (♀, Ansus, Jobi, April 1893: Meyer — C 10976).

Bill and feet black; iris vermilion (Gld. *3*).

Sex. The sexes are similarly coloured.

Young. Similar to the adult above, but with less metallic gloss; cheeks and under surface of body white, streaked with greenish black on the lower throat, fore neck, sides of body, flanks and under tail-coverts (Sharpe *12*).

Eggs. 2, sometimes 3; bluish grey, speckled with reddish pink, chiefly at the larger end; size 25 × 20 mm (N. Australia — McGillivray *3*). 3 or 4 in number, some roundish, others elongate; greenish white with bright reddish brown spots and dots, more numerous towards the large end; 26.5 × 19.5 mm (N. Australia — Ramsay *5, 11*).

Nest. Pensile, averaging two feet in length by one in breadth, somewhat oval in form, tapering above to a neck, by which it is suspended; the opening in the centre of the widest part. Built of pieces of the stem and the long tendrils of a climbing plant *(Cissus)*, matted and woven together, lined with finer pieces of the same, a few leaves (generally strips of *Pandanus*-leaf), the hair-like fibres of a palm *(Caryota cereus)*, and similar materials (McGill. *3*).

Distribution. Sula Islands (Wallace *2, 12*); Moluccas and Papuasia as far as New Guinea, the New Britain group, the Solomons, North Australia and, occasionally *(10)*, New South Wales (Salvadori *7, 13*).

In his original account of this species, Temminck indicated its habitat as Celebes and Timor. Later two specimens collected by Rosenberg were brought forward by Brüggemann, though with some doubt (*6*, p. 100), as proof of the occurrence of the bird in Celebes; but W. Blasius, who afterwards examined one of them, found that no locality was mentioned on the label. Another specimen in the Senckenberg collection *(15)* at Frankfort is labelled "Celebes", but we suppose this may be traced to Temminck's original error. The species cannot, therefore, be admitted into the Celebes list without further evidence. Sula birds are identified with *C. metallica* by Wallace and Sharpe, after specimens obtained by Allen in the Sula Islands. The present species may be distinguished from *C. panayensis*, *C. p. sangirensis*, *sulaensis*, and *minor*, which occur in one part or another of the Celebesian Province, by its strongly graduated tail, the two middle feathers overreaching the next by about 25 mm; the fine auricula-purple on the head, mantle and jugulum also render it easily recognisable.

A close investigation of *C. metallica* would probably bring to light many local variations of insufficient stability to justify their being scientifically removed from the first-discovered race and concealed from the eyes of general knowledge under the mask of specific names. A new comparison of such forms as *C. nitida* Gray, of New Britain, *C. circumscripta* Meyer, of Timorlaut, *C. inornata* Salv., of Mysore, *C. purpureiceps* Salv., of the Admiralty Islands, *C. fuscovirescens*

Salv., of Sorong and Salawatti, *C. gularis* Gray, of Mysol, might, we think, be made with a view to ascertaining whether there is not sufficient individual variation among them to bridge-over the differences which are said to separate them from *C. metallica* and from one another; in other words, whether they are not subspecies, instead of species.

GENUS ENODES Temm.

Structurally like *Calornis*, but the wing shorter. Plumage non-metallic. Tail about as long as the wing, strongly graduated, outermost rectrix about half the length of the middle ones. Legs and feet yellow. A long and broad superciliary stripe of decomposed and stiffened feathers, red.

The genus is peculiar to Celebes.

* 235. ENODES ERYTHROPHRYS (Temm.).

Red-browed Starling.

a. **Lamprotornis erythroprhys** *(1)* Temm., Pl. Col. pl. 267 (1824); *(2)* Less., Traité d'Orn. 1831, 407.

Enodes erythroprhys *(1)* Temm., Pl. Col. I, Tabl. Méth. p. 108 (1838); *(2)* Blyth, Cat. B. Mus. As. Soc. 1849, 111; *(3)* Bp., Consp. 1850, I, 417; *(4)* Schl., Handl. Dierk. 1857, 341; *(5)* Wall., Ibis 1860, 141; *(6)* Finsch, Neu-Guinea 1865, 174; *(7)* Wall., Malay Archip. 1869, I, 430; *(8)* Wald., Tr. Z. S. 1872, VIII, 78; *(9)* Salvad., Ann. Mus. Civ. Gen. 1875, 668; *(10)* Brügg., Abh. Ver. Bremen 1876, V, 78; *(11)* Meyer, Ibis 1879, 134; *(12)* W. Blas., J. f. O. 1883, 138; *(13)* Tristr., Cat. Coll. B. 1889, 251; *(14)* Sharpe, Cat. B. XIII, 1890, 192; *(15)* Heine & Rchnw., Nomencl. Mus. Hein. 1890, 108; *(16)* Hartert, Kat. Vog. Slg. Senckenb. Mus. 1891, 75; *(17)* M. & Wg., Abh. Mus. Dresd. 1894, Nr. 8, p. 14; *(18)* iid., ib. 1896, Nr. 1, p. 6; *(XIX)* Meyer, Vogelskel. 1897, II, pl. CCXVII.

b. **Calornis erythroprhys** *(1)* Gray, Gen. B. II, 327 (1846); *(2)* id., HL. II, 1870, 27, Nr. 6394; *(3)* Rosenb., Malay. Archip. 1878, 273.

"Katupi", Manado and Taguatto (= ? Paguat), Reinwardt *a I.*

"Katupi", near Manado, Nat. Coll.

Figures and descriptions. Temm. *a I*; Meyer *XIX* (skel.); Schl. *4*; Sharpe *14*.

Adult male. Lores, sides of crown and of occiput reddish Chinese orange, forming a broad superciliary stripe of short, stiff, bristly feathers; general colour above and below slate-grey, darkest on crown between the superciliary stripes, palest above the ear-coverts, on malar region and chin; ear-coverts, subloral and subocular regions and a ring round the eye black; rump, upper and under tail-coverts and crissum Indian yellow; wings yellowish olive-green, the inner webs and free ends of the quills black; tail olive-greenish yellow, the terminal part of the two lengthened centre-feathers pale yellowish; under wing-coverts greenish yellow mixed with slate-grey. "Iris sepia, in the middle a darker line; legs sulphur-yellow", claws blackish; bill black (♂, Tomohon, 6. III. 94: P. & F. Sarasin).

Female. Like the male, but apparently a little smaller, and the yellow colour not extending quite so far up on the rump (♀, ♀, near Tomohon, 7th and 9th March, 1894: P. & F. Sarasin).

Immature. Browner slate-grey than the adult, superciliary stripe yellower and less broad (Minahassa: Faber — C 3504; Brügg. *10*).

Measurements.	Wing	Tail	Tarsus	Bill from nostril
a. (Sarasin Coll.) ♂ ad., Tomohon	116	120	27	13.5
a^{bis}. (Sarasin Coll.) ♂ ad., Tomohon, 5. IV. 95 . . .	114	—	28	13
b. (Sarasin Coll.) ♀ ad., Tomohon	111	106	25	12.5
c. (Sarasin Coll.) ♀ ad., Tomohon	111	111	25.5	12.5
d. (C 2193) ad., Kakas, June 71 (Meyer)	110	109	26.5	13.5
e. (C 2192) ad., Kakas, June 71 (Meyer)	109	—	26.5	13.5
f. (C 5218) ad., Manado (Musschenbr.)	113	108	26	13.5
g. (C 3503) ad., Minahassa (Faber)	109	110	26.5	12.5
h. (C 10825) ad., near Tondano, Aug.—Sept.92 (Nat. Coll.)	111	114	25.5	13
i. (C 2195) vix ad., Kakas, June 71 (Meyer)	108	110	26	13
j. (C 3504) imm., Minahassa (Faber)	106	110	26.5	12

Nest, eggs, etc. Unknown. The nest and nestlings in the Sarasin Collection, labelled as belonging to *Enodes erythrophrys*, and recorded by us as such *(17)*, seem to belong to *Dicrurus leucops*.

Distribution. Celebes, Northern Peninsula: Minahassa (Reinwardt *a I*, Wallace *5*, *14*, Meyer *11*, etc.); "Ile Taguatto" = ? Paguat, Gulf of Tomini (Reinwardt *a I*).

The Red-browed Starling of Celebes is the only representative of the genus *Enodes*, one of the peculiar types of the island. Except for Reinwardt's specimen from Paguat, it has up to the present been recorded only from the Minahassa. Here it seems to be purely a hill species, most of the specimens on record having been killed in the neighbourhood of Lake Tondano; Rosenberg mentions the fact that he never met with it in the Gorontalo Province.

The genus seems to stand midway between *Calornis* and *Acridotheres*. By its bill, wing-formula, and strongly graduated tail, it answers very well to the *Calornis metallica*-group; its non-metallic plumage agrees better with the tints of *Acridotheres tristis* (L.) of the Indian countries, it also resembles birds of this genus by its legs and feet. The striking orange-red colour of the superciliary stripe no doubt has some connection with the peculiar bristly character of the feathers here; the red of the wax tips on the inner quills of the Waxwing *(Ampelis garrula)*, and the red tips of the rump-feathers of *Scissirostrum* may prove to be of somewhat similar structure. Another point of interest is the pale yellowish of the projecting 2 cm of the two middle tail-feathers, they look as if they have become more bleached through greater exposure. Many birds have the tip of the tail paler or more colourless than the rest of it.

GENUS ACRIDOTHERES Vieill.

The frontal plumes erect or slightly turned backwards, and growing above the nostril as far forward as the anterior margin thereof; bill as long as the head and somewhat tapering, yellow, the gape deep and turned downwards at

an angle; tail rather short, rounded; wing moderate, the secondaries about $^3/_4$ its length; tarsus and feet yellow, large, the tarsus about as a long as the middle toe and claw; sexes similar. Range: Afghanistan to Celebes.

* 236. ACRIDOTHERES CINEREUS Bp.

Celebes Myna.

Acridotheres cinereus *(1)* Bp., Consp. I, 1850, 420; *(2)* Finsch, Neu Guinea 1865, 174; *(3)* Gray, HL. II, 1870, 20, Nr. 6289; *(IV)* Wald., Tr. Z. S. 1872, VIII, 77, pl. X, fig. 1; *(5)* Blyth, Ibis 1873, 79; *(6)* Meyer, Ibis 1879, 134; *(7)* Guillem., P. Z. S. 1885, 556; *(8)* Sharpe, Cat. B. XIII, 1890, 91; *(9)* Büttik., Zool. Erg. Weber's Reise Ost-Ind. 1893, III, 280; *(10)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 13; *(11)* Hart., Zov. Zool. 1896, 154.

Figure and descriptions. Walden *IV*; Bonaparte *1*; Sharpe *8*.

Adult. Above smoke-grey, paler on the rump and upper tail-coverts, where the shafts of the feathers are whitish; head above, clothed with lanceolate feathers, and upper ear-coverts slaty black; chin, throat, jugulum, thighs, and axillaries dark smoke-grey, crossed with obscure brownish bars; malar region darker; remaining under-parts pale smoke-grey, tinged with fulvous on the middle of the body; middle of abdomen pale cinnamon; under tail-coverts white, washed with isabelline; wings above dark bistre-brown; the lesser coverts broadly edged, the middle coverts more narrowly bordered, with drab; the smaller bastard-wing-feather outwardly white; primary coverts white; the free ends and inner webs of the primaries black; across the base of the primaries a broad white band; tail brownish black, tipped with white, increasing in width towards the outermost feathers, the shafts blackish; "iris lemon-yellow; bill and feet yellow" (♀, Kalibankere, Tjamba Distr., S. Cel., 1. VIII. 78: Platen — C 5372). Wing 129 mm; tail 73; tarsus 34.5; bill fr. nostril 15.

Dr. Guillemard describes the iris in the male as brownish orange, bill red-orange, feet yellow.

Sexes. Similar in plumage (Sharpe *8*).

Remark. The example described above is in worn plumage. Dr. Sharpe describes the abdomen as "greyish white, sides of body, flanks and thighs light ashy grey, under tail-coverts white". A female in good plumage in the Sarasin Collection has the chin, throat, and thighs dark smoke-grey, uniform.

Distribution. Celebes, Southern Peninsula: Macassar (Wallace *8*, Meyer *6*, Weber *9*, etc.), Pankadjene (P. & F. Sarasin *10*), Tanette (Meyer *8*), Tjamba Distr. (Platen in Dresd. Mus.), Maros (Guillem. *7*), Tete Adji (Weber *9*).

Just as *Enodes* is known only from the Northern Peninsula of Celebes, so the present species is at present known only from the Southern Peninsula. Meyer found it very common near Macassar, but both Guillemard and he mention that they never met with it in North Celebes. Its nearest affinities are with the Javan *A. javanicus*, Cab., and it follows the rule that when a Celebesian species is closely related to one occurring between Java and Timor, its habitat is sure to be South Celebes, but not always the North as well. *Acridotheres javanicus* differs in being dark brownish slate above and dark mouse-grey below;

the bill is pure yellow, while in *A. cinereus* there is a small dark space at the base of the lower mandible.

Acridotheres belongs to the Oriental Region, and numbers, according to Sharpe, eight species, whose eastward range is bounded by Java and South Celebes. The genus is, curiously enough, absent from Borneo; it also does not occur in the Philippines, except for the Chinese *A. cristatellus* which is found in Luzon, where it is supposed to have been introduced, in order to destroy locusts.

In its habits *Acridotheres* resembles the Common Starling of Europe; feeding on worms, grubs and refuse; sociable and intelligent, congregating and roosting in companies; like most sociable individuals, talkative, learning to speak fairly well, which causes it to be valued as a cage-bird; uproarious before retiring to rest; very pugnacious in the nesting-season: "desperate fights take place between two or three couples, in which the females take their part" (*A. cristatellus*, Styan, Ibis 1891, 357); nesting in holes, and laying bright blue eggs. Mr. Hume even wonders whether the Bank Myna, *A. ginginianus*, is superstitious, for wherefore the presence of snake-skin in their nests, unless as a "charm" or "scare-snake"?! (Nests and Eggs, Oates ed. 1889, I, 382.)

GENUS SCISSIROSTRUM Lafr.

A genus confined to Celebes, remarkable for the structure of the yellow bill. Culmen about as long as the cranium, decurved, very high, being higher than the crown, and the bill very strong, much deeper than broad; the nostril small, long oval, placed in a groove between the culmen and a projecting side-ridge of the maxilla. Wing moderate, 2nd, 3rd and 4th quills the longest; tail rather shorter than the wing and much graduated; tarsus and toes rather small, yellow, the tarsus barely as long as the middle toe and claw; the tips of the feathers of the rump and upper tail-coverts stiffened, as if with wax, deep red.

* 237. SCISSIROSTRUM DUBIUM (Lath.).

Grosbeak Starling.

a. **Dubious Shrike** *(1)* Lath., Gen. Syn. Suppl. 1801, 72.

b. **Lanius dubius** *(1)* Lath., Ind. Orn. 1801, II, p. XVIII.

c. **Scissirostrum pagei** *(1)* Lafresn., Rev. Zool. 1845, 93; *(II)* id., Mag. de Zool. 1845, pl. 59; *(3)* Blyth. Cat. B. Mus. As. Soc. 1849, 119; *(4)* Bp., Consp. I, 1850, 423; *(5)* Cab., J. f. O. 1854, p. LXIV; *(6)* Schl., Handl. Dierk. 1857, 342; *(7)* Wall., Ibis 1860, 141; *(8)* id., Malay Archip. 1869, I, 430; *(9)* Musschenbr., N. T. Ned. Ind. 1876, XXXVI, 382; *(10)* Rosenb., Malay. Archip. 1878, 273.

d. **Sissirostrum pagei** *(1)* Gray, Gen. B. II, 328 (1846).

Scissirostrum dubium *(1)* Hartl., Arch. Nat. 1847, XIII, pt. 2, 57; *(2)* Finsch, Neu Guinea 1865, 174; *(3)* Gray, HL. II, 1870, 27, Nr. 6395; *(4)* Wald., Tr. Z. S. VIII, 1872, 81; *(5)* Salvad., Ann. Mus. Civ. 1875, VII, 668; *(VI)* Brügg., Abh. Ver. Bremen

1876, V, 79, t. III, f. 11, 12; *(7)* Lenz, J. f. O. 1877, 376; *(8)* Meyer, Ibis 1879, 146; *(IX)* id., Abb. Vogelsk. I, 1882, 19, pl. XXIV; *(10)* W. Blas., J. f. O. 1883, 138; *(11)* Guillem., P. Z. S. 1885, 556; *(12)* id., Cruise "Marchesa" 1886, II, 168; *(13)* W. Blas., Ztschr. ges. Orn. 1886, 126; *(14)* Tristr., Cat. Coll. B. 1889, 255; *(15)* Sharpe, Cat. B. XIII, 1890, 193; *(16)* Heine & Rchw., Nomencl. Mus. Hein. 1890, 108; *(17)* Hartert, Kat. Vg. Senckenb. Mus. 1891, 76; *(18)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 14; *(19)* iid., ib. 1896, Nr. 2, p. 18; *(20)* Hart., Nov. Zool. 1896, 154; *(21)* id., ib. 1897, 162.

"Sije mulut kuning", Banka Id., Nat. Coll.

"Siëk", Manado, Guillem. *11.*

"Moloneti", Rosenb. *c 9.*

"Salingoka", E. Celebes, Nat. Coll.

"Sin" or **"Sing"**, Peling and Banggai, iid.

Figures and descriptions. Lafresnaye *c II, c 1*; Meyer *IX* (skeleton); Schlegel *c 6*; Brüggemann *VI*; Sharpe *15.*

Adult. Slaty mouse-grey; wings and tail black, the wing-coverts edged with the colour of the back; feathers of rump, upper tail-coverts and a few on the flanks blackish, with long stiff tips of poppy-red varying to carmine; eyelid, lores and feathers against base of bill blackish, about half a dozen short decurved bristles sprouting at the lores; under wing-coverts slaty; quills below where they rest upon the body dusky smoke-grey; under tail-coverts slaty black (ad. Banka, 17. V. 93: Nat. Coll. — C 12178; ♀ ad. Tomohon, 5. III. 94: P. & F. Sarasin). "Iris reddish; bill bright orange; tarsus orange" (Guillem. *11*).

Young. Browner than the adult, — viz. dark smoke-grey above and below; the feathers of rump and flanks tipped with pale yellowish and pale scarlet, the tips less waxy than in the adult; bill much more slender and less thickened below the nostrils; wing 97 mm, bill from nostril 11.5 (Manado: Meyer — C 2724).

Measurements. Wing (20 adults — N. Celebes) 94—101 mm; tail 78—86 ca.; tarsus 21 ca.; bill from nostril 14 ca.

Variation. A specimen, ♀ ad., from Bonthain, S. Celebes (C 7080) differs from 26 examples from the Minahassa in having the side-walls of the nostril more bloated and angular, and the red tips on the rump and upper tail-coverts longer and more extensive. It appears therefrom that the southern birds are rather different from the northern. Wing 98 mm; tail 81; tarsus 21, bill from nostril 14.5. Specimens from Peling, Banggai and E. Celebes are like those of the North.

Skeleton (Meyer *IX*).

Length of cranium . . .	38.0 mm	Length of tibia	36.6 mm
Greatest breadth of cranium	17.2 »	Length of tarso-metatarsus .	20.2 »
Length of humerus . . .	22.0 »	Length of sternum. . . .	27.2 »
Length of ulna	28.5 »	Greatest breadth of sternum	17.6 »
Length of radius	24.5 »	Height of crista sterni . .	9.3 »
Length of manus	28.0 »	Length of pelvis	29.5 »
Length of femur	22.0 »	Greatest breadth of pelvis .	21.0 »

Distribution. North Celebes — Minahassa (Lélancher *c 1*, Wallace *c 7*, etc.); Banka and Lembeh (Nat. Coll.); Togian (Meyer *8*); West Celebes (Doherty *21*); East Celebes, Peling and Banggai (Nat. Coll.); South Celebes — Macassar (Wallace *c 7, 15*), Bonthain (Ribbe & Kühn), Indrulaman (Everett *20*).

The genus *Scissirostrum* is peculiar to Celebes, with Peling and Banggai, and is one of the most striking types of the island. The present species, the only one known, is a very common bird in the Minahassa, where, as Mr. Wallace *(c 7)* writes, it occurs "in flocks about the hill-plantations, often settling on dead trees, in the holes of which it builds, and keeping up a loud and almost continuous chirping". They cling to the tree-trunks as easily as Woodpeckers or Creepers; their food is grain and fruits *(c 8)*. The Sarasins observed that in the middle of August enormous flocks of these birds peopled the tall red-flowering *Erythrina*-trees, which are scattered everywhere in the gardens at Kema. Near Macassar Mr. Wallace found it a scarce bird, and, as mentioned above, the birds inhabiting the Southern Peninsula probably differ racially from those of the North, as is the case with so many other species, and the difference shows how unfrequently or slowly an interbreeding of Northern and Southern individuals of this active species takes place. The narrowness and mountainous character of the neck of land uniting the Northern Peninsula with the mainland, the mountainous character of the island in general, and the great distance between the Minahassa and the Southern Peninsula are sufficient to make it a matter of no surprise when a naturally stationary bird presents differences of a local character in the North and South. Such differences afford no proof that the South was once cut off from the North by water.

The chief peculiarity of this bird is its upper bill, which is much swollen at the base, so that the nostrils lie in a deep groove with the base of the culmen between them. This gives the bird a Grosbeak-like appearance, and Schlegel remarked *(c 6)* that the bird seemed to afford a transition from the Starlings to the Sparrows. Brüggemann, who was always observant of ancestral indications in young birds, first pointed out that the bill of the young was distinctly sturnine. Bonaparte *(4)* placed *Scissirostrum* in a subfamily with that queer bird *Euryceros*(!) of Madagascar; Wallace *(c 8)* remarked that it seemed most nearly allied in its general structure to the Ox-peckers *(Buphaga)* of Africa, "next to which the celebrated ornithologist Prince Bonaparte finally placed it". As Count Salvadori points out no such affinity is apparent either in the form of the beak, tail, or feet; the bill of *Buphaga* bears some resemblance to that of the Pigeons of the genus *Osmotreron*, and Dr. Sharpe makes it a separate subfamily of the *Sturnidae*. *Scissirostrum* was placed by Lord Walden *(4)* between *Calornis* and *Eulabes*, to which position Count Salvadori *(5)* afterwards assented; Dr. Sharpe puts it next to *Enodes* at the end of the *Sturnidae*. We are inclined to think that *Scissirostrum* may claim a closer affinity to *Acridotheres* than to any existing form, but undoubtedly its position among the *Sturnidae* is rather remote. The skeleton differs very considerably from that of *Calornis*.

Attention has been drawn elsewhere to the red colour of the wax tips to the feathers of the rump. In many birds bright colours such as red or orange accompany a stiff, bristly development of the feather.

GENUS STURNIA Less.

A migratory member of this Sturnine genus occurs in Celebes. The bill is shorter than the cranium, not stout, a membrane above the nostril. Wing long, 2nd primary the longest, secondaries about $^3/_5$ the wing-length, tail short, square or rounded; tarsus rather large, much longer than the culmen, about equal to middle toe and claw.

Range: India and Eastern Siberia to the Moluccas.

238. STURNIA VIOLACEA (Bodd.).

Red-cheeked Starling.

a. **Le Grand Traquet des Philippines** *(I)* Briss., Orn. 1760, III, 446, pl. 22, fig. 3; *(II)* Daubent., Pl. Enl. III, pl. 185, fig. 2.

b. **Motacilla violacea** *(I)* Bodd., Tabl. Pl. Enl. 1783, 11.

c. **Pastor ruficollis** *(1)* Wagl., Syst. Av., 1827, Pastor sp. 19.

d. **Lamprotornis pyrrhogenys** *(I)* Temm. & Schl., Faun. Jap., Aves 1850, 86, pl. XLVI.

e. **Heterornis pyrrhogenys** *(1)* Bp., Consp. 1850, I, 418; *(2)* Swinh., P. Z. S. 1863, 302.

f. **Temenuchus pyrrhogenys** *(1)* Gray, HL. II, 1870, 21, Nr. 6301; *(2)* Tristr., Cat. Coll. B. 1889, 252.

g. **Sturnia pyrrhogenys** *(1)* Wald., Tr. Z. S. VIII, 1872, 78; *(2)* Swinh., Ibis 1874, 151, 159; *(3)* Brügg., Abh. Ver. Bremen 1876, V, 77; *(4)* Meyer, Ibis 1879, 134; *(5)* Seeb., B. Japan. Emp. 1890, 108.

h. **Sturnia dominicana** *(1)* Salvad. (nec Bodd.), Cat. Ucc. Borneo 1874, 269.

Sturnia violacea *(1)* Wald., Tr. Z. S. IX, 1875, 203; *(2)* Sharpe, Tr. L. S. 1879, (2) I, 308, 343; *(3)* Salvad., Orn. Pap. II, 1881, 445; *(4)* Wardl. Rams., Tweedd. Orn. Works 1881, 658; *(5)* W. Blas., J. f. O. 1883, 115; *(6)* id., Zt. ges. Orn. 1886, 120; *(7)* Wardl. Rams., Ibis 1886, 162; *(8)* W. Blas., Ornis 1888, 315; *(9)* id., Ibis 1888, 374; *(10)* Everett, P. Z. S 1889, 224; *(11)* id., J. Str. Br. R. A. S. 1889, 143; *(12)* Sharpe, Ibis 1889, 431; *(13)* Whitehd., Ibis 1890, 56; *(14)* Sharpe, Ibis 1890, 280; *(15)* id., Cat. B. XIII, 1890, 70; *(16)* Salvad., Agg. Orn. Pap. 1891, 237; *(17)* Burns & Worces., B. Menage Exp. 1894, 37.

For further synonymy and references compare Sharpe *15*; Salvadori *3*.

Figures and description. Daubenton *a II*; Temminck & Schlegel *d I*; Salvadori *3*; W. Blasius *6*; Sharpe *15*.

Adult [**male**]. General colour above black, glossed with dark purple, the primary coverts, greater wing-coverts, inner quills and tips and outer edges of the others, and tail glossed with bronze-green; middle wing-coverts, edge of wing, most of the outer edge of the first three primaries, and of the outermost tail-feather and basal part of the outer edge of the first three secondaries white; head, rump and upper tail-coverts drab-grey, the latter parts mixed with the purple black of the back; ear-coverts and some feathers on sides of neck chestnut; sides of head, chin, throat, jugulum, middle of breast, abdomen, under wing-coverts and quills below where they rest upon the body white, tinged with fulvous on the head, throat, abdomen and under tail-coverts; chest, sides of breast and of body dark grey (Gorontalo, Celebes: Riedel — Nr. 2217).

"Iris, upper mandible and feet, black; lower mandible blue-grey" (Whitehead *12*).

Adult [female]. Differs from the male in being dark drab-brown above; the greater wing-coverts, secondaries, tips of the primaries, and tail glossed with greyish green; tips of the middle wing-coverts and basal part of the first three secondaries externally dirty white; ear-coverts pale drab; remaining parts much as in the adult male, but the sides of the body paler and browner grey (Gorontalo: Riedel — Nr. 2218).

Dr. Sharpe describes the female plumage as that shown above. Prof. W. Blasius *(6)* describes the female as like the male but rust-yellow, not white, on the quills below where they rest upon the body; intense rust-yellow on the chin, the edges of the tail-feathers and quills.

Young. Much resembles the female.

Distribution. Japan *(d I, e 2, f 2, g 2, g 5)*, Eturop, Kurile Is. (Blakiston & Pryer *g 5*), Loochoo Is. (Stejneger *g 5*); Philippines — Luzon (Maitland Heriot *7*), Negros and Mindanao (Steere *2*), Palawan (Platen *8, 9, 13*), Tawi Tawi and Mindoro (Bourns & Worcester *17*); Borneo — North (Whitehead & Treacher *11, 12*), South-east (Grabowsky *6*); Celebes, Northern Peninsula — Gorontalo (Riedel *g 3* and in Dresd. Mus.), Minahassa (Riedel *6*, Faber in Dresden Mus.); Batchian (Wallace *3, 15*).

It is remarkable that the Red-cheeked Starling, which is a winter migrant from Japan, has been obtained, with the exception of a specimen in the Dresden Museum from v. Faber, only by Dr. Riedel in Celebes; and Prof. W. Blasius rightly remarks that this is to be explained on the ground that the bird is not always present there, but only occurs at certain times on migration, and then, probably, in great flocks, such as were met with by Grabowsky in S. E. Borneo. Dr. Schadenberg met with it in swarms in the Philippines, 18th April, 1885. As a similar case, it may be mentioned that in August—September, 1892, our native collectors met with *Glareola isabella* V. near Lake Tondano in great numbers. It is remarkable also that the bird has never been met with in China, nor in Formosa, where Swinhoe looked for it without success, and its migration seems to be made straight from Japan and the Loochoo Islands to the Philippines without touching any part of the Asiatic continent.

Its nearest ally is *Sturnia sturnina* (Pall.), (= *daurica* Pall.), of E. Asia, migrating in winter to Malacca and Java, the adult male of which differs by wanting the red ear-coverts, and by having a blackish patch on the nape, and buff-white scapulars; the young is distinguished by Dr. Sharpe by the broad white edging to the outer tail-feather, — very narrow in *S. violacea*.

GENUS BASILEORNIS Bp.

The members of this genus are of about the size of a Thrush and striking-looking birds by reason of the feathers of the head, which meet in the mesial line to form a high ridged crest, or in one species a high recurved crest over the crown. A small space of bare skin below and behind the eye. In the Celebesian species the nostril and much of the culmen is hidden by the crest-

feathers. The bill is whitish, about as long as the head, with a pendant tip or hook. Wing large, 2nd—4th quills the longest. Tail moderate, 12 feathers, rounded or slightly graduated. Feet and tarsus yellow, large; tarsus longer than the culmen. Plumage metallic. Three species are known from Celebes, Banggai, and Ceram.

* 239. BASILEORNIS CELEBENSIS G. R. Gray.

Celebes King Starling.

a. **Basilornis corythaix** *(1)* Bp. (nec. Wagl.), Consp. 1850, I, 420; *(2)* Cab., Mus. Hein. I, 1851, 207, note; *(3)* Schl., Handl. Dierk. 1857, 342.

b. **Basilornis celebensis** [Temm. in Leyden Mus.], *(I)* Gray, P. Z. S. 1861, 184, fig.; *(II)* Sclat. & Wall., Ibis 1861, 284, pl. IX, fig 2; *(3)* Finsch, Neu Guinea 1865, 174; *(4)* Wall., Malay Archip. 1869, I, 430; *(5)* Gray, HL. II, 1870, 19, Nr. 6279; *(6)* Meyer, Ibis 1879, 133; *(7)* W. Blas., J. f. O. 1883, 138; *(8)* id., ib. 1885, 403; *(IX)* id., Ztschr. ges. Orn. 1885, 298, fig.; *(10)* Tristram, Cat. Coll. B. 1889, 251; *(11)* Heine & Rchw., Nomencl. Mus. Hein. 1890, 110; *(12)* Hartert, Kat. Senckenb. Mus. 1891, 77.

Basileornis celebensis *(1)* Wald., Tr. Z. S. VIII, 1872, 77; *(2)* Brügg., Abh. Ver. Bremen 1876, V, 77; *(3)* Guillem., P. Z. S. 1885, 555; *(4)* Sharpe, Cat. B. XIII, 1890, 95; *(5)* Meyer, Abh. u. Ber. Dresden Mus. 1894, Nr. 2, 1; *(6)* M. & Wg., ib. 1895, Nr. 8, p. 14; *(7)* iid., ib. 1896, Nr. 1, p. 14; *(8)* iid., ib. 1896, Nr. 2, p. 18; *(9)* Hart., Nov. Zool. 1896, 154.

c. **Basilornis celensis** (err.), *(1)* Rosenb., Malay. Archip. 1878, 273.

"Radja sië" (King of the Glossy Starlings), Malay, Minahassa, Meyer *b 6*, Guillem. *3*, Nat. Coll.

"Pokakang", Minahassa, Nat. Coll.

"Biruro", Tjamba Distr., Platen *b IX*.

"Uwenta", Tonkean, E. Celebes, Nat. Coll.

Figures and descriptions. Sclater & Wallace *b II*; Gray *b I*; W. Blasius *b IX*; Schlegel *a 3*; Sharpe *4*; Meyer *5*.

Adult male. Black, glossed on the head and neck with violet steel-blue, on the back, upper tail- and wing-coverts, throat and under-parts with dark metallic green; quills blackish brown; tail black, slightly glossed on the outer webs; a patch on the ear-coverts white, bounded behind by tawny-tipped feathers; a large patch on the sides of the jugulum buffy white; under wing-coverts glossy greenish black; quills below drab-grey, almost white where they rest upon the body, duskier towards the ends; a long compressed ridge-crest reaching from in front of the nostrils to above the occiput; a few short white hair-feathers here and there, chiefly on the throat; around and behind the eye a small space of bare skin, apparently blue-black in life. "Eye-lashes black; bill whitish blue-grey; feet lemon-yellow" — Platen *9* (♂ ad. Kema, N. Celebes, 1. X. 93: P. & F. Sarasin). Wing 138 mm; tail 88; tarsus 29; bill from nostril 16.

Female. Similar to the male, but the crest-feathers shorter (11 mm as against 14 mm) and less glossy. "Iris brown-red" — also in male (♀ ad. Kalibangkere, S. Celebes, 20. III. 78: Platen — C 13414, W. Blas. *b IX*).

Immature. Above glossy green-black, like the adult; head black with a small crest-ridge; chin, throat and malar region and sides of breast pale brown with dark centres to the feathers; ear- and chest-patch buffy white; remaining under-parts dull brownish

black, mixed with the glossy green-black feathers of maturity (Manado: v. Musschenbroek — C 5217).

Distribution. Celebes: Minahassa (Wallace *1*, *4*, Meyer *b 6*, Fischer *2*, etc.); Lembeh Id. (Nat. Coll.); Gorontalo Distr. (v. Rosenberg *c 1*, Meyer *b 6*); Tonkean, East Celebes (Nat. Coll. *8*); Macassar (Wallace *1*, *4*); Tjamba Distr., S. Cel. (Platen *b IX*); Indrulaman, Bonthain Distr. (Everett *9*).

This species, the "King Starling" in the Malay vernacular of North Celebes, is generally a somewhat scarce species in the island, though Rosenberg found it not rare in the hill-forests, where it feeds on fruits. Three species of the genus are now known; the present, confined to Celebes, *B. corythaix* (Wagl.) of Ceram[1]), with a long and differently-shaped crest, which rises to a point in somewhat triangular form above the occiput, and *B. galeatus* Meyer, from Banggai Island, a larger form and with a magnificent crest like that of the Celebes species, but three times as long.

Basileornis is a somewhat isolated *sturnine* genus, the ridge-crest, which, as Mr. Wallace says, resembles in form that of the well-known Cock-of-the-Rock of South America, distinguishing it from all other Starlings at a glance. Dr. Sharpe (Cat. B. 1890, XIII, 194) appears to us to make a very hazardous statement touching *Fregilupus varius* (Bodd.), the extinct Crested Starling of Réunion, when he says that this genus *(Fregilupus)* "comes very close to *Basileornis*, but differs in its much longer and more convex bill, its more exposed nostrils, and in the long crest which commences at the base of the bill"; it would have been more to the point if our learned friend had mentioned any feature whatever in which the two birds resemble one another, whether of plumage, structure, or any other character. *Melanopyrrhus anais* (Less.) of New Guinea agrees with *Basileornis* in tarsus, feet, bill, bare skin about the eye, tail, wing, and to a considerable extent in coloration; it differs by its smooth crestless head, the broad white bar across its wings, and its golden tawny rump and breast, but the latter parts are to some extent mixed with black, and the young seems to resemble *Basileornis* still more in coloration.

Were the tail of *Basileornis celebensis* greatly lengthened and graduated, and the white patches on the sides of the breast spread out broadly over the breast and across the hind neck, the bird would then bear a not remote resemblance to its compatriot, *Streptocitta*. We are inclined to regard *Basileornis* as somewhat intermediate between *Streptocitta* and *Melanopyrrhus*. That *Basileornis* and *Streptocitta* gradually arose from a common stem in the island of Celebes itself would be a very questionable hypothesis, but it appears most likely that the simpler *Basileornis celebensis* is the form from which the more eccentric *B. corythaix* and *galeatus* sprang, and hence Celebes has at present most claim to be regarded as the land of origin of *Basileornis*. To find the form which may have given rise to it and to *Melanopyrrhus* of New Guinea it is necessary to look further back.

[1]) Gray identified *(b 1)* the *Pastor corythaix* Wagl. with the Ceram bird, though Cabanis *(a 2)* has said — we hope erroneously — that it was described from the type of Temminck's *B. celebensis*.

* 240. BASILEORNIS GALEATUS A. B. M.

Greater King Starling.

Plate XXXVI.

Basileornis galeatus *(1)* Meyer, Abh. Mus. Dresd. 1894, Nr. 2, p. 2, fig.; *(2)* M. & Wg., ib. 1896, Nr. 2, p. 19.

"Randing", Banggai, Nat. Coll.

Figure and description. Meyer *I.*

Diagnosis. Differs from *B. celebensis* in having the crest about 3 times as high; the tail more rounded, the outermost feather being about 20 mm shorter than the middle ones, as against 10 mm in the mainland species; size larger.

Bill yellowish white; legs and feet yellow, claws browner (in skin).

Young. The crest much shorter than in the adult; chin brown, throat less glossy; upper mandible clouded with dusky; general plumage less glossy (Banggai — C 14719).

Measurements.	Wing	Tail	Tarsus	Bill from nostril
a. (C 13283) ad., type, locality unknown	144	100	32.5	18
b. (C 14718) ad., Banggai Id., V.—VIII. 95 (Nat. Coll.)	149	99	34	20
c. (C 14716) ad., Banggai Id., V.—VIII. 95 (Nat. Coll.)	mlt.	94	32	17
d. (C 14717) ad., Banggai Id., V.—VIII. 95 (Nat. Coll.)	143	97	32	18
e. (C 14719) juv., Banggai Id., V.—VIII. 95 (Nat. Coll.)	137	93	30	16

Distribution. Banggai Island (Nat. Coll. in Dresd. & Tring Mus.).

This fine species is known only from the small island of Banggai between East Celebes and Sula, where six specimens were collected by our hunters in 1895. It is not known where the type of the species came from, but it appears to differ in no way from the Banggai birds.

In respect of its crest this species appears to be a highly developed form of the simpler *B. celebensis* of the mainland of Celebes. A further modification of the crest is seen in *B. corythaix* of Ceram.

GENUS STREPTOCITTA Bp.

A form peculiar to Celebes, easily distinguishable from the other *Passeres* of the island by its extremely long graduated tail, which is sometimes double the wing in length, with the outermost rectrix only about $^1/_3$ the length of the middle ones. The feathers of the head are somewhat lengthened and "waxy", those of the lores and nostril directed upwards and forwards, hiding the nostril. Bill about as long as the cranium, decurved, with a slight hook; a space of bare skin around and behind the eye; 1st primary longer than in most Starlings, about 35 mm, 3rd and 4th the longest; tarsus and feet black, the tarsus longer than the culmen and about equal to the middle toe with claw. The black of the plumage glossy. Sexes alike.

* 241. STREPTOCITTA ALBICOLLIS (Vieill.).

South Celebes Magpie.

a. **Pie de la Nouvelle Calédonie** *(1)* Labillardière, Voy. à la Recherche de la Pérouse 1791—92, II, 218, Atl. pl. 39.

b. **Pie of New Caledonia** *(1)* Labill., Voy. Engl. Trans. (Stockdale) II, 227, pl. 39.

c. **Caledonian Crow** *(1)* Lath., Gen. Syn. Suppl. 1801, II, 116; *(2)* Gray, B. Trop. Is. 1859, 25.

d. **Corvus caledonicus** *(1)* Lath. (nec Gm.), Ind. Orn. Suppl. 1801, II, p. XXV.

e. **Pica albicollis** *(1)* Vieill., N. Dict. Hist. Nat. 1818, XXVI, 128; *(2)* Gray, Gen. B. II, 314 (1846); *(3)* id., HL. II, 1870, 11, Nr. 6179.

f. **Pica caledonica** *(1)* Less., Tr. d'Orn 1831, 333; *(2)* Rosenb., Malay. Archip. 1878, 273.

g. **Streptocitta caledonica** *(1)* Bp., Consp. 1850, I, 382; *(2)* Finsch, Neu Guinea 1865, 173; *(3)* Wald., Tr. Z. S. VIII, 1872, 75; *(4)* Meyer, Ibis 1879, 133; *(5)* id., Ibis 1880, 249, 373; *(6)* W. Blas., J. f. O. 1883, 115.

Streptocitta albicollis *(1)* Sclat., Ibis 1859, 113; *(2)* id., Ibis 1866, 210; *(3)* Schl., N. T. Ned. Dierk. 1866, III, 1; *(4)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 667; *(5)* W. Blas., J. f. O. 1883, 129; *(6)* id., J. f. O. 1885, 403; *(VII)* id., Ztschr. ges. Orn. 1885, 205, 296, pl. XIII, fig. 1; *(8)* id., ib. 1886, 119; *(9)* Sharpe, Cat. B. XIII, 1890, 153; *(10)* Büttik., Zool. Erg. Weber's Reise Ost-Ind. 1893, III, 280; *(11)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 14; *(12)* Hart., Nov. Zool. 1896, 155; *(13)* id., ib. 1897, 158, 159.

h. **Streptocitta torquata** *(1)* Platen (nec. Temm.), Gefied. Welt 1879, 379.

"Ponto kalong", Tjamba Distr., Platen *VII.*

Figures and descriptions. W. Blasius *VII, 8*; Labillardière *a I*; Sharpe *9.*

Adult. Jugulum, breast and a broad collar around the neck pure white; all the remaining parts black, strongly glossed with steel-blue and green reflections on head all round, upper and under surface of the body, upper and under tail-coverts and edges of the wing-coverts, the green tints being more pronounced on the rump and under-surface; wings and tail dusky black with a slight gloss externally, the tail crossed with close, narrow bars, seen only in certain lights, throughout its length; bill black, terminal third yellow. "Iris brown; bill black, tip yellow; feet black" — Platen (♂, Kalibangkere, 3. IV. 78: Platen — C 11209).

Sexes. The sexes do not differ in coloration. The stiff broad feathers covering the head may perhaps be a little broader and more developed in the male.

Immature. A specimen, which from the inferior development of the characteristic feathers of the head and shorter tail we hold for immature, has also the bill less broadly tipped with yellow, viz. about $^1/_4$, instead of $^1/_3$ to nearly $^1/_2$ (♀, Kalibangkere, 29. III. 78: Platen — C 5472).

Measurements.	Wing	Tail	Tarsus	Bill from nostril
a. (C 11209) ♂ ad., Tjamba Distr., 3. IV. 78 (Platen) .	151	251	36	18.5
b. (C 5373) ♂ ad., Tjamba Distr., 12. III. 78 (Platen) .	158	285	36	19
c. (C 6963) ad., Maros (Ribbe & Kühn)	147	295	36	18.5
d. (C 11210) ♀ ad., Tjamba Distr., 21. III. 78 (Platen)	158	285	36.5	18.5
e. (C 5472) ♀ imm., Tjamba Distr., 29. III. 78 (Platen)	149	260	37	17
f. (Sarasin Coll.) ♂ ad., Loka, S. Cel., 19. X. 95 . .	150	300	—	19
g. (Sarasin Coll.) ♀ vix ad., Kandari, S. E. Cel., 22. XII. 94	145	250	—	18

The above measurements show great individual variableness in regard to the tail, a point already observed by Prof. W. Blasius. It consists as usual of 12 feathers, strongly graduated, the outermost being only 75—85 mm long.

Distribution. South Celebes: Buton or Muna Island (Labillardière *a I*); Kandari (Beccari *4*, P. & F. Sarasin *11*); near Macassar (Wallace *1*, *2*, *9*, Everett *12*); Maros (Ribbe & Kühn in Dr. Mus., Weber *10*); Tjamba Distr. (Platen *h 1*, *VII*); Bonthain Distr. (Doherty *13*, P. & F. Sarasin).

This species was first made known to science by Labillardière, one of the naturalists who accompanied Dentrecasteaux's expedition in search of the unfortunate "La Pérouse". Labillardière mentions with some circumstantiality that he and his companions killed it in a great forest in New Caledonia, and Lesson *(f 1)* notes that Quoy & Gaimard got it in Vanicoro in the Santa Cruz Group! The genus is, however, found nowhere but in the Celebes Province and the present species is known only from the south of the island. On his way home, after leaving Buru, Dentrecasteaux passed through the Strait of Buton between the islands of Buton and Muna. Eighteen days were spent in making the passage, and parties landed on both islands. No other point of Celebes was touched at, and there can be no doubt that it was on one of these islands that the "Pie de la Nouvelle Calédonie" was obtained. The "Astrolabe", whose collections were treated of by Quoy & Gaimard, called at Manado on the way home, and a number of new species were then obtained there. The common *Streptocitta torquata* of North Celebes was no doubt obtained here, and confused, apparently, with *S. albicollis* by Lesson, to whom possibly the wrong locality, Vanicoro, is due.

In appearance this bird is very like a Magpie, but it seems to occupy an intermediate position between the *Corvidae* and *Sturnidae*. The absence of projecting bristles covering the nostril induces us to class it with the Starlings. A trait of character described by Dr. Platen is very Magpie-like; the traveller describes his encounter with a fine Bird-of-prey, which was chased with loud cries, bold opposition, and occasional attacks with the bill made from the rear by six or eight birds of this species.

The genus *Streptocitta* is most nearly allied to *Charitornis* of Sula, which has the sides of the face and the chin and upper throat bare. Schlegel *(3)* remarks that *Streptocitta* approaches the *Graculae (Melanopyrrhus, Mainatus)* rather than the Pies, especially by the relative proportions of the primaries, the bare nostrils, the form of the feathers on the sides of the forehead, and the angle of the gape being turned downwards, as is the case in the great family of Starlings of which the *Graculae* are a part. After *Charitornis albertinae*, which, besides having the face bare of feathers, may be distinguished from *Streptocitta* by its white head and under surface (except crissum, thighs and under tail-coverts), we should place *Basileornis* as the nearest known ally of *Streptocitta*. The characteristic feathering of the head of *Basileornis* repeats itself to some

extent in the broad stiff feathers of the head of *Streptocitta*, which have a decided tendency to form into a ridge-crest upon the forehead. The African *Lamprotornis*, which has a long tail like that of *Streptocitta*, is really more remote; this genus has a more lengthened middle toe.

Streptocitta, with its Sulan ally *Charitornis*, ranks, like *Basileornis* and *Scissirostrum*, as one of the striking Celebesian types.

S. albicollis of the South differs from *S. torquata* of the North, West and East of the island by its bill being tipped with yellow. If they are found to intergrade, the two will have to be united as subspecies under the specific name of the southern form.

* 242. STREPTOCITTA TORQUATA (Temm.).

Northern Celebes Magpie.

a. **Garrula torquata** *(1)* Temm., Pl. Col. pl. 444 (1828).

b. **Pica torquata** *(1)* Schl., Handl. Dierk. 1857, 322; *(2)* Gray, HL. II, 1870, 11, Nr. 6180; *(3)* Rosenb., Malay. Archip. 1878, 273.

Streptocitta torquata *(1)* Wald., Tr. Z. S. VIII, 1872, 76; *(2)* Salvad., Ann. Mus. Civ. Gen. VII, 1875, 667; *(3)* Brügg., Abh. Ver. Bremen 1876, V, 77; *(4)* Lenz, J. f. O. 1877, 376; *(5)* Meyer, Ibis 1879, 133, 146; *(6)* id., Ibis 1880, 249; *(VII)* id., Abb. Vogelskel. I, 1882, 20, pl. XXV; *(7bis)* W. Blas., J. f. O. 1883, 138; *(8)* Guillem., P. Z. S. 1885, 555; *(IX)* W. Blas., Ztschr. ges. Orn. 1885, 296, pl. XIII, fig. 2; *(10)* id., ib. 1886, 118; *(11)* Platen, Gefied. Welt 1887, 205; *(12)* Sharpe, Cat. B. XIII, 1890, 152; *(13)* M. & Wg., Abh. Mus. Dresden 1895, Nr. 8, p. 14; *(14)* iid., ib. 1896, Nr. 1, p. 14; *(15)* iid., ib. 1896, Nr. 2, p. 19; *(16)* Hart., Nov. Zool. 1897, 162.

c. **Garrulus caledonicus** *(1)* Joest (nec V.), Das Holontalo 1883, 105.

d. **Streptocitta albicollis** *(1)* Heine & Reichenow, Nomenclator Mus. Hein. 1890, 108 (fide W. Blasius *10*).

"Burong pandita" (Parson-bird — in reference to its black body and white collar), Malay, Minahassa, Meyer *5*, Guillemard *8*.

"Walanglehe", Minahassa, Nat. Coll.

"Hendingo" [Gorontalo], Rosenb. *b 3*.

"Hentino", Joest *c 1*.

"Tiong", Tonkean, E. Celebes, Nat. Coll.

Figures and descriptions. Temminck *a I*; Meyer *VII*; W. Blasius *IX*; Brüggemann *3*; Sharpe *12*.

Adult. Like *S. albicollis*, but the bill entirely black, wing and tail rather shorter, bill a little longer (♀, Kema, 2. VIII. 93: Sarasin Coll.; and 22 others).

Young. Similar to the adult, but the feathers on the head less long and stiff, their bases white; chin and upper throat black, mottled with the white bases of the feathers (Minahassa: Faber — C 3608).

In some specimens, apparently adult, the white encroaches almost up to the chin (Minahassa: Faber — C 3609 and 3606).

Measurements.	Wing	Tail	Tarsus	Bill from nostril
a. (Sarasin Coll.) ♀ ad., Kema, 9. VIII. 93	146	255	—	18
b. (Sarasin Coll.) ♀ ad., Tomohon, 2. IV. 94	139	—	36	19
c. (C 5214) ♂ ad., Manado (v. Musschenbroek)	150	240	—	20.5
d. (C 5212) ad., Manado (v. Musschenbroek)	152	265	—	20
e. (C 5210) ♀ ad., Lembeh (v. Musschenbroek)	148	257	—	18
f. (C 5215) ♂ ad., Manado, VII. 74 (v. Musschenbroek)	147	260	—	18.5
g. (C 5213) ad., Manado (v. Musschenbroek)	149	270	—	18.5
h. (C 5211) ad., Manado (v. Musschenbroek)	151	258	—	18
i. (C 15640) ad., Gorontalo, 1876 (Riedel)	150	278	—	20
j. (C 15639) ad., Gorontalo? (Riedel)	151	—	—	—
k. (C 15642) ad., Gorontalo, 1876 (Riedel)	156	—	—	19.5
l. (C 15641) ad., Gorontalo, 1876 (Riedel)	156	284	—	19
m. (C 1793) ad., Manado, III. 71 (Meyer)	147	215	—	19
n. (C 1791) ad., Manado, III. 71 (Meyer)	150	258	—	19.5
o. (C 1792) ad., Manado, III. 71 (Meyer)	153	268	—	19
p. (C 1794) ♀ ad., Limbotto, VII. 71 (Meyer)	156	277	—	19
q. (C 3611) ad., Minahassa, 1877 (Faber)	150	272	—	19.5
r. (C 3614) ad., Minahassa, 1877 (Faber)	143	—	35	—
s. (C 3613) ad., Minahassa, 1877 (Faber)	141	—	—	19.5
t. (C 3607) ad., Minahassa, 1877 (Faber)	145	—	—	18.5
u. (C 3609) ad., Minahassa, 1877 (Faber)	146	250	—	17.5
v. (C 3606) ad., Minahassa, 1877 (Faber)	150	260	—	19.5
w. (C 3610) ad., Minahassa, 1877 (Faber)	140	250	—	20
x. (C 3608) imm., Minahassa, 1877 (Faber)	141	255	—	18.5

The above measurements show that this species is very variable when adult even after making allowance for seasonal changes. Average size: wing 148.8 mm, tail 259.8, bill from nostril 19.

The average size of the southern form is (from only 4 adults) wing 153.5 mm, tail 279, bill from nostril 18.6; it is evidently rather larger, apparently with a similar bill.

Remark. The bird seems to moult in April; specimen *b* is getting a fresh tail.

Skeleton (Meyer VII).

Length of cranium	58.3 mm	Length of tibia	59.0 mm
Greatest breadth of cranium	25.8 »	Length of tarso-metatarsus	35.4 »
Length of humerus	36.6 »	Length of sternum	38.5 »
Length of ulna	45.2 »	Greatest breadth of sternum	27.5 »
Length of radius	40.4 »	Height of crista sterni	12.8 »
Length of manus	41.0 »	Length of pelvis	43.4 »
Length of femur	35.0 »	Greatest breadth of pelvis	25.5 »

Distribution. North Celebes: Minahassa (Wallace *12*, Meyer *5*, Fischer *3*, etc.), Lembeh Id. (Nat. Coll.), Gorontalo Distr. (Meyer *5*, Riedel in Dresd. Mus., etc.); Togian (Meyer *5*); Dongala, West Celebes (Doherty *16*); Mapane, North Central Celebes (P.& F. Sarasin *14*); Tonkean, E. Celebes (Nat. Coll. *15*).

The Northern *Streptocitta* is a very common bird in the Minahassa, where, as Rosenberg says, it attracts attention by its harsh cry, in making which it

waves its tail up and down. As already remarked it may possibly be found to intergrade with its southern ally, *S. albicollis*, somewhere in the unknown intermediate countries; Beccari thought he saw this race with the yellow bill-tipped form of the south at Kandari, and Meyer got a specimen at Manado (?) with yellow on the bill, but no such specimens have been met with by other writers. Sixty-six examined by Brüggemann all had the bill black, and we also have seen large numbers, but none with yellow-tipped bills. The white of the breast encroaches in some specimens towards the chin, thus indicating its affinity to *Charitornis* in which all parts of the head and throat, where not bare, are white like the neck, breast, and abdomen.

GENUS CHARITORNIS Schl.

This inhabitant of the Sula Islands has a long tail like *Streptocitta* of Celebes, but differs in having the face, chin, and throat naked, and the bill, legs, and feet yellow. The plumage of the head, like most of the under parts, is white.

* 243. CHARITORNIS ALBERTINAE Schl.

Sula Magpie.

Charitornis albertinae *(1)* Schl., Ned. Tdschr. Dierk. 1865, III, 1, pl. VIII; *(2)* Sclat., Ibis 1866, 210; *(3)* Wald., Tr. Z. S. 1872, VIII, 76; *(4)* Sharpe, Cat. B. XIII, 1890, 153.

a. **Eulabes albertinae** *(1)* Gray, HL. II, 1870, 19, Nr. 6277.

Figure and descriptions. Schlegel *1*; Sharpe *4*.

Adult. General colour above glossy greenish black, with a very faint purple gloss; lesser and median wing-coverts like the back; remainder of the wing-coverts, quills and tail-feathers black, washed with steel-green on the edges; crown of head, entire hind neck, and under surface of the body white; the chin and upper throat, cheeks, lores, sides of face, and all the region above and behind the eye, including the greater part of the ear-coverts, bare, the skin corrugated; lower flanks, lower abdomen, thighs and under tail-coverts black glossed with green, as also the under wing-coverts and axillaries; a white feather near the edge of the under greater wing-coverts; quills black below. Total length 457 mm; culmen 32; wing 147; tail 267 (Sharpe *4*).

Distribution. Sula Mangoli (Bernstein *1*).

This remarkable species seems to be rather a rare bird in Sula, where it was not found by Wallace's assistant Allen, and it was first obtained in two female examples in February, 1864, by a native hunter sent out by Bernstein. Schlegel, who gives a full account of the bird, unfortunately omitted to point out its generic differences from *Streptocitta*, and Walden believed that the two could not be generically separated. The bare skin on the face, chin and throat, the yellow bill, feet and legs, the white plumage of the head and of nearly all the under surface readily distinguish *Charitornis* from its Celebesian ally; the first character is one of generic worth, and others will most likely be found if looked for.

In "The Malay Archipelago" 1869, I, 430, Mr. Wallace speaks of *Charitornis* as a bird entirely confined to Celebes; the Celebesian Subregion should have been said, for *Charitornis* probably does not occur in Celebes itself, but is an important link between Sula and the mainland through *Streptocitta*.

FAMILY CORVIDAE.

The Crows may be distinguished from the Starlings by the long bristles which sprout forward from the forehead in the former concealing the nostrils, and by the much larger first primary, which is about half as long as the wing. The only other Celebes birds which might be confused with them are the *Campophagidae*, which differ in having the shafts of the feathers of the rump dense and stiffened, the *Dicruridae*, which have ten rectrices only, and the *Oriolidae*, in which the nostril is exposed.

GENUS CORVUS L.

The Crows have a glossy plumage of black, or black and grey, or black and white. Nostril round, situated well behind the angle of the gonys, concealed by bristles. Wing long, the secondaries about $^2/_3$ its length, the first primary about equal to the secondaries. Tail moderate, nearly square. Tarsus about equal to middle toe and claw, black. Sexes alike.

Found almost everywhere, except in South America.

244. CORVUS ENCA Horsf.

East-Indian Crow.

Crows are omnivorous and, consequently, they are stationary birds in the East Indies; yet, having few enemies, they are often excessively abundant, and, being endowed with great flying-powers and very sagacious in looking out for themselves, they are less likely to be deterred by geographical barriers than many other birds, and an intermixture of birds in neighbouring localities seems to be a matter of not unfrequent occurrence. Moreover, individual variation is great. The birds seem to vary locally to a great extent, but it is impossible to separate most of them specifically. Dr. Sharpe (Cat. B. III 1877, 38—45) admits 4 species with a number of subspecies in the East Indies, viz. *Corone macrorhyncha* (Wagl.), *C. validissima* (Schl.), *C. philippina* (Bp.) and *C. enca* (Horsf.). Probably *Corone philippina* is a subspecies of *C. enca*, which, if so, may be separated into the following 5 races: *the typical Corvus enca* (Java, Celebes, Sula), *C. enca validus*[1]) (Bp.)

[1]) The name *tenuirostris* Moore, has of late years been shifted on to the Bornean race. The type was said to be from Bombay (Horsf. & Moore, Cat. B. Mus. E. I. Co. 1854, 558), and Jerdon (B. Ind. II, 297; Oates, Faun. B. Ind., B. I, 17), rightly or wrongly, makes it a synonym of *C. macrorhynchus* (Wagl.), while

— Malacca, Sumatra, Borneo, Timor; *C. enca philippinus* (Bp.) — Philippines; *C. enca violaceus* (Bp.) — Ceram; *C. enca orru* (Bp.) — Papuasia and some of the Moluccas. It must not be understood, however, that each of these races is a homogeneous body; for instance, Celebesian birds are not quite the same as Javan ones, nor North Celebesian ones quite the same as those of the South, nor the specimens from the islands a couple of hours rowing off the north coast of Celebes quite the same as those of the mainland; indeed it may safely be assumed that the birds would be found to differ almost everywhere, if any one would take the trouble to investigate them very closely. But whether a new name be tagged on to each local departure or not, a complete study of the Crow-races of the East Indies no doubt would bring to light many facts of interest; it must always be borne in mind, however, that a complete study is only possible with a complete series of specimens and data from all localities. Our material affords no approach to this completeness, so we confine ourselves to the Celebesian Subregion.

Celebesian Races.

a. **Corvus validus** var. *(1)* Wall., P. Z. S. 1862, 343 (Sula).

b. **Corvus validus** *(1)* Finsch, Neu-Guinea 1865, 174 (Celebes, Sula).

Corvus enca *(1)* Schl., Mus. P.-B. Coraces 1867, 29 (Cel., Sula); *(2)* Wald., Tr. Z. S. VIII, 1872, 74, 113; *(3)* Finsch & Conrad, Verh. zool.-bot. Ges. Wien 1873, 2, 12 (sep. copy); *(4)* Salvad., Ann. Mus. Civ. Gen. VII, 1875, 670; *(5)* Brügg., Abh. Ver. Bremen V, 1876, 75; *(5bis)* Lenz, J. f. O. 1877, 376; *(6)* Wald., P. Z. S. 1877, 548; *(7)* id., ib. 1878, 622; *(8)* Meyer, Ibis 1879, 133, 146; *(9)* W. Blas., J. f. O. 1883, 138, 158, 162; *(10)* id., Verh. zool.-bot. Ges. Wien 1883, 66; *(11)* id., Ztschr. ges. Orn. 1885, 295; *(12)* Platen, Gefied. Welt 1887, 205; *(13)* Hickson, Nat. in N. Celebes 1889, 91; *(14)* Büttik., Zool. Erg. Weber's Reise Ost-Ind. 1893, III, 280, 304; *(15)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 14; *(16)* iid., ib. 1896, Nr. 2, p. 19; *(17)* Hart., Nov. Zool. 1896, 155.

c. **Corone enca** *(1)* Sharpe, Cat. B. III, 1877, 43 (Cel., Sula); *(2)* Guillem., P. Z. S. 1885, 555.

d. **Corvus advena** *(1)* Rosenb. (nec Schl.), Malay. Archip. 1878, 273.

"Wokka wokka" or **"Woka woka"**, Minahassa, Meyer *8*, Rosenb. *d 1*, Guillem. *c 2*, Nat. Coll.

"Krah", South Celebes, Platen *11*.

"Papaa", Tonkean, E. Celebes, Nat. Coll.

Descriptions. Schlegel *1*, Sharpe *c 1*.

Adult. Black, the bases of the feathers whitish, the upper surface glossed with purple-blue, with slight bronze reflections, under-parts purplish slaty-black; culmen moderately arched, depressed at the base which is bare (not covered by the nasal bristles), the nasal bristles reaching half the length of the bill from the forehead. "Iris coffee-brown, bill and feet black" — S. Celebes, Platen *11* (♂, Kema, Feb. 1894: P. & F. Sarasin, Nr. 124).

Sharpe identified it with *enca* (Cat. B. III, 43) and afterwards separated it again (P. Z. S. 1879, 246); in any case the name should not be used for the Bornean race. *C. validus* Bp. was originally (Consp. I, 385) said to have come from Ceram and Halmahera; Schlegel (Bijdr. Dierk.: Genre *Corvus*, 13) says that Bonaparte probably confounded it with *Corvus validissimus* of Halmahera, and he corrects the habitat of *C. validus* to Sumatra, Borneo and Timor. It is distinguishable from *enca* by a somewhat longer bill. These transmutations of names will not commend themselves to modern ornithologists.

Sex. The sexes are similar, but the bill of the female is perhaps smaller (W. Blas. *11*).

Measurements.	Wing	Tail	Tarsus	Bill from nostril
a. (Nr. 4617) Java	288	145	50	38.5
b. (Nr. 4616) Java (v. Schierbr.)	272	140	47	36.5
c. (C 13228) ♂, Maros Waterfall, S. Cel., 22. II. 78 (Platen)	279	145	54	39
d. (Sarasin Coll.) ♂ ad., Kema, N. Celebes, II. 91	288	142	52	39
e. (C 2029) Manado, III. 71 (Meyer)	286	135	45	–
f. (C 2031) Manado, III. 71 (Meyer)	284	130	47	35
g. (C 826) Manado, III. 71 (Meyer)	280	142	48	35.5
h. (C 2028) juv. ? Manado, III. 71 (Meyer)	263	128	46	33
i. (C 2030) Manado, III. 71 (Meyer)	281	147	50	37
j. (C 5209) Manado (v. Musschenbr.)	280	135	50	39
k. (C 5208) Manado (v. Musschenbr.)	265	132	45	36
l. (C 12151) Manado tua Id., 14. IV. 93 (Nat. Coll.)	308	144	52.5	40
m. (C 12152) Manado tua Id., 17. IV. 93 (Nat. Coll.)	284	135	51	39
n. (C 12149) Mantehage Id., 22. IV. 93 (Nat. Coll.)	302	149	47	39
o. (C 12148) Mantehage Id., 23. IV. 93 (Nat. Coll.)	297	145	50	37
p. (C 12153) imm. ? Banka Id., 20. V. 93 (Nat. Coll.)	284	145	48	35
q. (C 12150) Banka Id., 19. V. 93 (Nat. Coll.)	280	136	47.5	38

Eggs. These have not yet been recorded from Celebes. From Java, Bernstein (J. f. O. 1859, 277) describes them as 4 in number, greenish blue with olive-brown and grey spots and points, mostly small, large and numerous only at the large end, but never so large and numerous as in *C. macrorhynchus*. Resembling those of the Rook, occasionally those of the Jackdaw. Size 34—40 × 27—29 mm.

Nest. In the top of a high, thick-leaved tree; made of dry twigs, roots and coarse stalks; lined, like that of *C. macrorhynchus*, with stalks, small roots, elastic fibres of the Areng palm (Bernstein l. c.).

Distribution. Celebes and Sula:— Lembeh, Banka, Mantehage and Manado tua (Nat. Coll.), Talissi Id. (Hickson *13*), Minahassa (Rosenb. *1*, Wallace *c 1*, etc.), Gorontalo Distr. (Rosenb. *1*), Buol (P. & F. Sarasin), Togian (Meyer *8*), E. Celebes (Nat. Coll.), Kandari, S. E. Celebes (Beccari *4*), S. Peninsula (Bernstein *1*, Wallace *c 1*, etc.); Sula Islands (Allen *a 1*, Bernstein and Hoedt *1*).

Two specimens of *the typical Corvus enca* from Java differ from Celebesian birds in having the bill horn-colour towards the tip; in colour there is little enough to choose between them and a South Celebes specimen, but the latter has a longer tarsus. The South Celebes bird and the Javan ones are slightly more bronzy above and have a slight brownish tinge below, not noticeable in the North Celebes race. The specimens from the islands immediately off the north coast seem to run larger in size (wing) than those of the mainland, thus following a rule we have noticed in many other birds (though, generally, from islands rather further off). No Crow has as yet been recorded from Sangi and Talaut.

This Crow is a common bird in Celebes. Mr. Wallace (Mal. Archip. 1869, I, 337) speaks of thousands of Crows haunting the plantations near Macassar; Meyer remarked that it was common everywhere in Celebes at all seasons;

Rosenberg describes it as bold beyond description and dangerous to poultry. It differs from *C. macrorhynchus* by its smaller size and broader, flatter culmen; this in *C. macrorhynchus* is high and compressed.

Corvus fallax Brüggem., Abh. Ver. Bremen V, 1876, 76. Described after an example from Rosenberg in Brüggemann's paper on birds from Celebes and Sangi. No locality is mentioned; Celebes is almost certainly wrong. Sharpe makes it a synonym of *C. enca*; it appears to us from the description to be *C. orru.*

Corvus modestus Brüggem. l. c. p. 77. Described from an example from Rosenberg, without mentioning locality. Sharpe (Cat. B. 1877, III, 45) identifies it with *C. violaceus* of Ceram. It may be safely regarded as not belonging to Celebes.

Corvus annectens Brüggem. l. c. p. 75. Brüggemann described this species after 1 specimen "from Celebes from Rosenberg". W. Blasius (J. f. O. 1883, 158, 162) examined the type and came to the conclusion that it was *Corvus macrorhynchus.* This species has never been heard of in Celebes before or since, and we believe that the locality is wrong. *C. macrorhynchus* varies in the same way as *C. enca*; three races of it have been distinguished with the following distribution: *the typical C. macrorhynchus* Wagl. — Malacca to Timor and S. Borneo; *C. macrorhynchus levaillanti* (Less.) — India to Burmah and the Andamans, Loochoo Islands; *C. macrorhynchus japonensis* (Bp.) — Japan, Bonin, Corea, China, East Siberia. Some of the principal references to the species are: Temm. & Schl. Faun. Jap. Aves 1850, 79, pl. 39; Schl. Bijdr. Dierk.: Notice genre Corvus, 7, 9, pl. I, figs. 3, 4, 5, 6; id. Mus. P.-B. Coraces 1867, 15, 19; Sharpe, Cat. B. III 1877, 38—42; Hume, Str. F. V, 1877, 461; Legge, B. Ceylon 1880, 346; Oates, B. Brit. Burmah 1883, I, 397; id. ed. Hume's Nests and Eggs Ind. B. 1889, I, 4; id., Faun. Brit. Ind. B. 1889, I, 17; Gigl. & Salvad, P. Z. S. 1887, 583; Seeb., B. Japan. Emp. 1890, 94; Tacz., Faune Orn. Sib. Orient. I, 1891, 530; Oust., Nouv. Arch. du Mus. 1894, 53.

Dr. Shufeldt has recently described a fossil *Corvus annectens* (J. Ac. Philad. 1892, IX, 389), a name which, of course, cannot stand.

GENUS GAZZOLA Bp.

This Celebesian form seems to differ from *Corvus* only in having the primaries shorter, the secondaries being $^3/_4$ the length of the longest, and the first primary is 20 mm shorter than the secondaries.

* 245. GAZZOLA TYPICA Bp.

Pied Crow.

a. **Gazzola caledonica** *(1)* Bp. (nec Gm., nec syn.), Consp. 1850, I, 383.

Gazzola typica *(1)* Bp., Comptes Rend. 1853, XXXVII, 828; *(2)* id., Notes Orn. Coll. Delattre 1853; *(3)* Hartl., J. f. O. 1854, 168 (N. Caledonia!); *(4)* Sclat., Ibis 1859, 113; *(5)* id., ib. 1860, 190; *(6)* Verr. & des Murs, Rev. Zool. 1860, 432 (N. Cal.!); *(7)* Sclat., Ibis 1861, 107; *(8)* Wald., Tr. Z. S. VIII, 1872, 74; *(9)* Sharpe, Cat. B. III, 1877, 47; *(10)* Büttik., Zool. Erg. Weber's Reise Ost-Ind. 1893, III, 280; *(11)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 14; *(12)* Hart., Nov. Zool. 1896, 155; *(13)* id., ib. 1897, 160.

b. **Corvus advena** *(1)* Schl. (nec Brehm), Bijdr. Dierk., Notice Corvus 1859, 3, pl. 2; *(2)* id., Mus. P.-B. 1867, Coraces 6; *(3)* Wall., Malay Archip. 1869, I, 375; *(4)* Gray, HL. II, 1870, 13, Nr. 6229.

Figure and descriptions. Schlegel *b I, b 2*; Sharpe *9*.

Adult. Head all round, chin, throat and upper surface, together with flanks, thighs and under tail-coverts, black with a purple gloss; all the remaining under-parts, including a broad collar covering the hind neck and upper part of mantle, white; under wing-coverts blackish brown. "Iris coffee-brown; bill, feet and orbital ring black" (♀, Kalibangkere, Tjamba Distr., I. VIII. 78: Platen — C 5374; ♂, Marangka, Maros Peak, 5. VII. 95: Sarasin Coll.).

Sex. Sexual differences of coloration are not known to exist.

Measurements. Wing (♀) 213, ♂ 220; tail ♀ 115, ♂ 120; tarsus ca. 40; bill from nostril ♀ 28, ♂ 31 mm.

Distribution. South Celebes: — Near the Maros Falls (Wallace *b 3, 9*), Maros Peak (P. & F. Sarasin *11*), Tjamba Distr. (Platen in Dresd. Mus.), Bonthain Mts. (Weber *10*, Everett *12*, Doherty *13*).

The little black-and-white Crow of Celebes is a well marked species, confined so far as is yet known to the South of the island, where few examples have been collected, but it is said by Mr. Doherty to be common enough north of Macassar and on Bonthain Peak. The confusion in regard to its history — it having been originally said to have come from New Caledonia, and it was identified with *Corvus (Graucalus) caledonicus* (Gm.) by Bonaparte — has been put straight by Dr. Sclater *(4)* and Lord Walden *(8)*. Where Bonaparte's type came from must be a matter of conjecture, but, as it was, like *Streptocitta albicollis*, said to have been a New Caledonian bird, it is possible that it was obtained at the same time and place as that species, viz. in the island of Buton or of Muna by the naturalists accompanying Dentrecasteaux.

The genus *Gazzola* is hardly to be separated from *Corvus*. The first primary is shortened, being about 20 mm shorter than the secondaries; the second is also shortened, reaching $^5/_8$ of the distance between the end of the first primary and the tip of the wing; the fourth quill is longest. The bill is large and slightly bloated in appearance, much resembling that of *Corvus enca*, but not slightly compressed at the sides in its terminal third. In plumage it is very like *Corvus dauricus* Pall. of E. Siberia, China and Japan, a Jackdaw

which is said by Mr. Styan (Ibis 1891, p. 358) to interbreed freely with *C. neglecta* Schl. *Gazzola typica* is easily distinguishable from *C. dauricus* by its large bill. The genus is peculiar to Celebes, but cannot be regarded as equal in interest to *Streptocitta*, *Scissirostrum*, and some others. Only six examples had been recorded prior to the recent visits of the Messrs. Sarasin, Everett and Doherty.

FAMILY ORIOLIDAE.

The true Orioles may generally be recognised by their yellow coloration. The bill is as long or longer than the cranium, notched and with a hooked tip; the nostril exposed, large, with a membrane above it. Ten remiges, the first as long as the secondaries, or less. Twelve rectrices. The young of the bright-coloured species are streaked below. A few forms wear a more simple, streaked plumage when adult. The Orioles look as if their affinities were with the *Paradiseidae* and the *Meliphagidae*, two groups which are not usually regarded as related to one another.

GENUS ORIOLUS L.

Description as for the family. Dr. Sharpe (Cat. B. 1877, III, 188) includes in the family of the Orioles also the genus *Sphecotheres*, distinguishable by having the periocular region naked. The Orioles are found in Europe, Africa, and Asia to Australia.

* 246. ORIOLUS CELEBENSIS (Tweedd.).

Celebes Oriole.

This variable Oriole differs racially in the Northern and Southern Peninsulas of Celebes. We take it that the species was described from North Celebesian examples, which represent, therefore, the typical race.

1. The typical Oriolus celebensis.

a. **Oriolus indicus** *(1)* Schl. (nec Jerd.), Mus. P.-B., Coraces, 1867, 103 pt.; *(2)* Rosenb., Malay. Archip. 1878, 272; *(3)* Joest, Das Holontalo 1883, 106.

b. **Broderipus coronatus** *(1)* Wald. (nec Sw.), Tr. Z. S. VIII, 1872, 60 pt.; *(2)* Lenz, J. f. O. 1877, 372.

c. **Broderipus celebensis** *(1)* Wald., Tr. Z. S. VIII, 1872, 112; *(2)* id., Ibis 1873, 306; *(3)* Meyer, J. f. O. 1873, 404; *(4)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 669; *(5)* Rosenb., Malay. Archip. 1878, 272; *(6)* Meyer, Ibis 1879, 125, 146; *(7)* W. Blas., J. f. O. 1883, 114, 117, 125, 137; *(8)* id., Ztschr. ges. Orn. 1885, 551, pt.; *(9)* Platen, Gefied. Welt 1887, 206.

d. **Oriolus coronatus** var. **celebensis** *(1)* Brügg., Abh. Ver. Bremen 1876, V, 62.

e. **Oriolus celebensis** *(1)* Sharpe, Cat. B. III, 1877, 203 pt.; *(2)* Guillem., P. Z. S. 1885,

551 pt.; *(3)* Tristr., Cat. Coll. B. 1889, 181; *(4)* Hickson, Nat. in N. Celebes 1889, 92; *(5)* Hartert, Kat. Senckenb. Mus. 1891, 79; *(V^bis)* Meyer, Vogelskel. II, 1892, 39, plate CLXVI; *(6)* Vorderman, N. T. Ned. Ind. 1893, LII, 200; *(7)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 14; *(8)* Hart., Nov. Zool. 1897, 162.

"Burong guning" (Yellow-bird) or **"Burong kuning"**, Malay, N. Celebes, Meyer *c 6*, Guillem. *e 2*, Hickson *e 4*, Nat. Coll.

"Kikeliawoi", Minahassa, Meyer *c 6*.

"Kilukilu", near Manado, Nat. Coll.

"Tongulalahe", Gorontalo, Joest *a 3*.

"Gulalahe" [Gorontalo], Rosenb. *a 2*.

"Kalijolo", E. Celebes, Nat. Coll.

Diagnosis. The black coronal circlet not united at the nape in about half the specimens [? the males]; the outermost tail-feather varying from pure yellow to yellow with a considerable black patch in the basal third; middle pair of tail-feathers greenish yellow to greenish yellow with a small amount of black before the yellow tips; secondaries greenish yellow externally, the innermost with a narrow space only of black along the inner web (19 examples, N. Celebes).

Distribution. North Celebes: Talissi (Hickson *e 4*), Lembeh, Banka (Rosenberg *a 1*, Nat. Coll.), Minahassa (Riedel *a 1*, Wallace *c 1*, *e 1*, etc.), Gorontalo Distr. (Rosenb. *a 1*, Meyer *c 6*, etc.), Togian (Meyer *c 6*); West Celebes (Doherty *e 8*); S. E. Celebes: Kandari (Beccari *c 4* — perhaps the Southern form).

2. Oriolus celebensis meridionalis Hart.

f. **Oriolus indicus** *(1)* Schl. (nec Jerd.), Mus. P.-B., Coraces, 1867, 103, pt.

g. **Broderipus coronatus** *(1)* Wald., Tr. Z. S. VIII, 1872, 60 pt.

h. **Broderipus celebensis** *(1)* Salvad., Ann. Mus. Civ. Gen. VII, 1875, 669, pt. ? (Kandari); *(2)* W. Blas., Ztschr. ges. Orn. 1885, 271, pt.

i. **Oriolus celebensis** *(1)* Sharpe, Cat. B. III, 1877, 203, pt.; *(2)* Guillem., P. Z. S. 1885, 551, pt. (Maros); *(3)* Büttik., Zool. Erg. Weber's Reise Ost-Ind. 1893, III, 276; *(4)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 14.

j. **Oriolus celebensis meridionalis** *(1)* Hart., Nov. Zool. 1896, 155; *(2)* id., ib. 1897, 158, 159.

"Kuriri", Tjamba Distr., Platen *h 2*.

Diagnosis. With more black on the wings and usually on tail; the black coronal circlet always meeting at the nape; the outermost tail-feather yellow, with the outer web and more or less of the inner web black for the basal third; the centre tail-feathers greenish yellow with a greater or less amount of black before the yellow terminal border; innermost secondaries black on most or all of the inner web (C 13424, Mus. Dresden, and other examples, S. Celebes).

Distribution. South Celebes: Macassar (Wallace *g 1*, Bernstein *f 1*, etc.), Bonthain Distr. (Weber *i 3*, P. & F. Sarasin, etc. *j 1*, *j 2*), Maros (Platen *h 2*, Guill. *i 2*, Weber *i 3*), Kalibangkere (Platen *h 2*), Luwu and Palopo (Weber *i 3*).

Oriolus celebensis — meridionalis.

k. **Oriolus celebensis** *(1)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 2, p. 19.

Diagnosis. Intermediate between the birds of the South and the North.

Distribution. East Celebes — Tonkean and Balante (Nat. Coll. in Dresd. and Tring Mus.).

Observation. It is hard to distinguish these birds. The innermost secondaries have generally more black on the inner web than in the Northern examples. The black coronal

ring is divided at the nape in one specimen only out of seven, in two others it is nearly divided, in the other four it is complete. An intermediate position seems most correct for them.

The species.

Figure and descriptions of the species in general: Meyer *e V* (skeleton); Walden *c 1*, Brüggemann *d 1*, Sharpe *e 1*, W. Blasius *c 8*.

Adult. Yellow, washed with ochraceous on the back and scapulars, inner quills greenish yellow externally, centre tail-feathers greenish yellow, pure yellow at the tip, preceded by a small subterminal patch of black, under surface deep gamboge-yellow; a broad circlet of black passing from the lores through the eyes towards the nape (where it meets in this specimen); bastard-wing and quills black, the latter edged with whitish; lateral tail-feathers yellow, partly black on the basal third of the outermost, the black increasing in extent by gradations on the outer and the inner webs of the others till it occupies most of the fifth pair; under wing-coverts and edge of metacarpus yellow; quills below shining drab, whitish fawn where they rest upon the body (N. Celebes: Riedel — Nr. 5201).

"Iris red; feet bluish grey; claws black; bill rosy" (Meyer *c 6*).

Sexual differences. Two females from S. Celebes examined by Prof. W. Blasius *(h 2)* differed by the lighter brownish colour of the quills, and the broad, paler yellow border of the secondaries, as of the primaries; while five males had the quills black, with narrow pale borders, and the inner secondaries with intense, sharply defined, yellow outer webs. Unlike Prof. W. Blasius, we suspect that the complete black coronal circlet in North Celebes is a sexual character.

Young. Differs from the adult by wanting the black coronet; paler yellow below, breast greenish yellow with blackish shaft-streaks; head and back greenish olive yellow; quills light brown with pale borders; centre tail-feathers olive [-yellow], (cf. Blas. *h 2*).

Immature. We agree with Prof. W. Blasius that the absence of black near the tips of the two middle tail-feathers is a sign of immaturity.

Measurements.	Wing	Tail	Bill from nostril
a. (Nr. 5199) ad., Gorontalo (Riedel)	143	107	—
b. (Nr. 5202) ad., Gorontalo (Riedel)	132	102	20.5
c. (Nr. 5201) ad., Gorontalo (Riedel)	147	103	20
d. (Nr. 5200) ad., Gorontalo (Riedel)	146	102	22.5
e. (Nr. 5203) vix ad., Gorontalo (Riedel)	139	105	20
f. (C 2202) ad., Manado, March 1871 (Meyer)	136	100	—
g. (C 2203) ad., Manado, March 1871 (Meyer)	137	101	19.5
h. (C 2201) ad., Manado, March 1871 (Meyer)	136	95	20.5
i. (C 2204) ad., Manado, March 1871 (Meyer)	137	100	—
j. (C 3494) ad., Minahassa (v. Faber)	140	96	21
k. (C 3497) ad., Minahassa (v. Faber)	134	96	—
l. (C 3498) ad., Minahassa (v. Faber)	136	100	21
m. (C 3496) ad., Minahassa (v. Faber)	—	—	20.5
n. (C 3495) ad., Minahassa (v. Faber)	145	103	20.5
o. (C 5192) ad., Manado (v. Mussch.)	139	—	19
p. (C 15648) ad., Manado (v. Schierbr.)	140	102	—
q. (C 10877) vix ad., near Manado, VIII.—IX. 94 (Nat. Coll.)	132	95	18.5

(Measurements continued.)	Wing	Tail	Bill from nostril
r. (C 12278) ad., Banka, 10. V. 93 (Nat. Coll.) . . .	135	93	20.5
s. (C 12277) ad., Banka, 14. V. 93 (Nat. Coll.)	145	100	21
t. (C 13423) ♂ ad., Maros, S. Cel., 10. II. 78 (Platen) .	143	102	20.5
u. (C 13424) ♂ ad., Maros, S. Cel., II. 78 (Platen) . .	148	97	—
v. (C 13425) ♂ ad., Maros, S. Cel., II. 78 (Platen) . .	139	99	—
w. (C 13426) ♂ ad., Kalibangkere, S. Cel., 3. IV. 78 (Plat.)	144	99	21
x. (C 13427) ♀ vix ad., Maros, S. Cel., 15. II. 78 (Platen)	141	101	—

The Gorontalo birds appear to be on an average a trifle larger.

Skeleton.

Length of cranium	51.0 mm	Length of tarso-metatarsus . .	22.4 mm
Greatest breadth of cranium .	20.7 »	Length of digitus III . . .	24.5 »
Length of humerus	31.2 »	Length of sternum	30.5 »
Length of ulna	38.0 »	Greatest breadth of sternum .	20.0 »
Length of radius	36.0 »	Height of crista sterni . . .	10.5 »
Length of manus	36.0 »	Length of coracoideum . . .	25.0 »
Length of metacarpus . . .	21.2 »	Length of scapula	28.0 »
Length of digitus principalis .	15.6 »	Length of clavicula	22.0 »
Length of femur	27.0 »	Length of pelvis	32.0 »
Length of tibia	37.5 »	Greatest breadth of pelvis . .	21.0 »
Length of fibula	16.0 »		

Egg. "An egg in my collection taken by Dr. Platen at Rurukan, Minahassa, differs in no way from those of our common *O. galbula*" (Nehrkorn MS.).

The Celebesian Golden Oriole is very closely related to *O. coronatus* Sw. of Sumatra, Java, Borneo, and to *O. insularis* Vord. of the Kangean Islands. Except that *O. celebensis* is not smaller than *O. coronatus*, Brüggemann has well pointed out the differences between the two forms; **1.** *O. celebensis* has a shorter bill; **2.** it wants the yellow speculum formed by the tips of the primary coverts (one of our S. Celebesian specimens shows this as in Java birds); **3.** the two middle tail-feathers are greenish yellow in *O. celebensis*, black in *O. coronatus*, in both tipped with yellow; **4.** the black coronet is broader in the Javan form. In respect of the tail the two forms never seem to intergrade. The Kangean form is said to have the tail like *O. coronatus*, by which it may be distinguished from our bird.

The South Celebesian race stands nearer to *O. coronatus* than does that of North Celebes, suggesting that Celebes was colonised from the south, or that there has been a recent immigration and admixture of Javan birds in the South.

Dr. Platen says *O. celebensis* almost always flies in pairs, and has a clear note. Its Javan relative is described by Bernstein (J. f. Orn. 1859, 270) as having a flute-like song like the European *O. galbula* L., feeding chiefly upon insects, occasionally fruit, and attaching its nest to the fork of an outermost twig in the top of a high tree.

* 247. ORIOLUS FRONTALIS Wall.

Sula Oriole.

Oriolus frontalis *(1)* Wall., P. Z. S. 1862, 340, pl. XL; *(2)* Finsch, Neu Guinea 1865, 173; *(3)* Gray, HL. II, 1870, 292, Nr. 4309; *(4)* Cab., J. f. O. 1872, 392, 393; *(5)* Sharpe, Cat. B. III, 1877, 204; *(6)* id., P. Z. S. 1879, 315; *(7)* Heine & Rchw., Nomencl. Mus. Hein. 1890, 112; *(8)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 2, p. 19.

a. **Oriolus acrorhynchus** pt. *(1)* Schl., Mus. P.-B., Coraces, 1867, 105 (Sula).

b. **Broderipus frontalis** *(1)* Wald., Tr. Z. S. VIII, 1872, 61; *(2)* Wald. & Lay., Ibis 1872, 101; *(3)* Wald., Ibis 1873, 306; *(4)* id., Tr. Z. S. IX, 1875, 185.

c. **Oriolus chinensis** pt. *(1)* Guillem., P. Z. S. 1885, 261.

"Simodui" or **"Simodowu"**, Peling and Banggai, Nat. Coll.

Figure and descriptions. Wallace *1*; Sharpe *5*.

Adult. Above and below brilliant deep lemon-yellow; crown, occiput, sides of head to just below the eye, and lores black; forehead yellow; bastard-wing, remiges, and tail black, the middle rectrices very narrowly, the lateral rectrices broadly tipped with yellow, attaining to a width of about 35 mm on the inner web of the outermost (about 20 mm on the outer web), (ad. Banggai — C 14712).

Immature. The yellow of the neck, mantle, and wing-coverts washed with olive; inner remiges greenish olive (with some black feathers of the adult dress intermingled); middle tail-feathers olive-green (Banggai — C 14714).

Measurements (6 adults: Peling and Banggai). Wing 152—158 mm; tail 109—116; tarsus c. 26; bill from nostril 23.5—26.

Young. Much paler than the adults, and having faint streaks of yellow on the head, the frontal plumes being narrowly tipped with black; wings brown externally; shaded with olive, the primaries with grey; least wing-coverts bright yellow like the back, the greater series brown, externally with a broad margin of yellow; four middle tail-feathers dull olive-yellow, the second pair slightly blackish towards the tips, the rest of the feathers olive-green at the base, and tipped with yellow principally on the inner web, the blackish subterminal shade greatly increasing towards the outermost feathers; entire under surface of body bright yellow, including the under wing- and tail-coverts (Sharpe *5*).

Distribution. Sula Islands: Sula Besi and Sula Mangoli (Allen *1*, *5*, Bernstein and Hoedt *a 1*), Peling and Banggai (Nat. Coll. in Dresd. and Tring Mus.).

According to Mr. Wallace, this species differs from *O. acrorhynchus* Vig. *(= chinensis)* of the Philippines in its richer and more uniform colour, longer tail, jet-black wings and middle tail-feathers, and the smallness of the yellow frontal spot. Dr. Sharpe *(6)* says the only difference is the slightly greater extent of yellow on the tail-feathers of the Philippine bird; and on comparing Peling and Banggaai examples with those of the Philippines and *O. palawanensis* we are at a loss to point out further reliable distinctions, though the yellow of the forehead seems to be more abruptly truncated behind.

* 248. ORIOLUS BONERATENSIS M. & Wg.

Bonerate Oriole.

Oriolus boneratensis *(1)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 16; *(2)* Hart., Nov. Zool. 1896, 169.

Adult. Deep lemon-yellow; a broad fillet passing from lores, above and below the eye, round the nape, black; bastard-wing and remiges black, the primary coverts broadly tipped with yellow, forming a speculum, the secondaries slightly tipped with yellowish; rectrices black, tipped with yellow, about 1 cm broad on the middle pair, increasing to 4 or 5 cm on the outermost: "iris deep cinnabar-red; bill white, tinged with rosy red; feet dark olivaceous grey" — Everett *2* (♂, Djampea, Dec. 1895: Everett — C 14878).

Sexes. The sexes are alike (Hartert *2*). Two females in the Sarasin Collection from Bonerate have the upper parts washed with olivaceous orange.

Individual variation. "The colour is a pure and perfect orange in some specimens; in others some feathers are orange, others yellow; in some the whole plumage is washed with yellow, while others are of a pure lemon-yellow without a shade of orange, and of the latter some have the mantle faintly tinged with greenish. These variations in colour are either due to age or perhaps to food, but not to sex or locality, specimens from Kalao being perfectly similar to those from Djampea" (Hartert).

Measurements. Wing 162—173 mm; tail 123—133 (Hartert evidently measures from the root, we from the oil-gland); tarsus 26—29; culmen 36—38 (Hartert *2*).

Distribution. Bonerate (P. & F. Sarasin *1*); Djampea and Kalao (Everett *2*).

The type of this large Oriole is a female obtained by the Sarasins in Bonerate Island in December, 1894; they subsequently acquired two more specimens from the same island, and Mr. Everett a series from Djampea and from Kalao, where he found it more numerous than in Djampea. The nearest known affinities of this bird are with *O. broderipi* Bp. of the Lesser Sunda Islands, a smaller species, with a less stout bill, the primaries as well as the secondaries tipped with yellow. There is an error in the description of the type of *O. boneratensis*; the middle rectrices are not entirely black, but tipped with yellow, though the yellow tip is broken off in one feather and the other is not full grown; herein it resembles *O. broderipi*. The Celebes Oriole is easily distinguishable from the present bird by its small size, absence of the speculum, etc.; the Sula, Talaut, and Sangi birds by their black heads, with only the forehead yellow, and by other points.

* 249. ORIOLUS FORMOSUS Cab.

Sangi Oriole.

This species belongs to the Sangi Islands, but varies locally.

1. The typical Oriolus formosus.

a. **Oriolus formosus** *(1)* Cab., J. f. O. 1872, 392; *(2)* Wald., Tr. Z. S. 1875, IX, 186; *(3)* Meyer in Rowl. Orn. Misc. II, 1877, 228, pt.; *(4)* Salv. & Sclat., Ibis 1877, 378; *(V)* Meyer, Vogelskel. I, 1882, 20, pl. XXV; *(6)* id., Isis, Dresden 1884, 6 (Siao); *(7)* M. & Wg., J. f. O. 1894, 248, pt.

b. **Broderipus formosus** *(1)* Wald., Ibis 1873, 306; *(2)* Rowley, Orn. Misc. II, 1877, 227 pt.; *(3)* W. Blas., Ornis 1888, 642.

"Kariawo", Siao, Nat. Coll.

Diagnosis. Average size larger (4 adults: wing 174 mm, tail 138, tarsus 29.9, bill from nostril 26.6); yellow frontlet larger, i. e. extending more to the sides above the fore part of the lores, the black lores consequently more broadly separated by yellow from the nostril.

Distribution. Siao (Meyer *a 1* and in Dresd. Mus., Nat. Coll. in Dresd. and Tring Mus.).

2. Oriolus formosus sangirensis n. subsp.

c. **Oriolus acrorhynchus** partim *(1)* Schl., Mus. P.-B., Coraces, 1867, 105 (Sangi).

d. **Oriolus formosus** *(1)* Brügg., Abh. Ver. Bremen V, 1876, 61; *(2)* v. Koch, Verz. Vogelbälg. Cel. u. Sanghir 1876, 2; *(3)* Salvad., Ann. Mus. Civ. Gen. IX, 1876, 60; *(4)* Sharpe, Cat. B. III, 1877, 205; *(5)* Fischer, Abh. Ver. Bremen V, 1878, 538; *(6)* Salvad., Atti Ac. Torino XIII, 1878, 1187; *(7)* W. Blas., J. f. O. 1883, 132; *(8)* Meyer, Isis, Dresden 1884, 6, pt.; *(9)* Tristr., Cat. B. 1889, 181; *(10)* M. & Wg., J. f. O. 1894, 248, pt.

e. **Broderipus formosus** *(1)* Rowley, Orn. Misc. II, 1877, 227, pt., pl. LVI; *(2)* Meyer, l. c. remarks, pt.; *(3)* W. Blas., Ornis 1888, 607.

"Tariawo", Great Sangi, Nat. Coll.

Figures. Rowley *e 1.*

Diagnosis. Average size smaller (4 adults: wing 167 mm, tail 129.3, tarsus 29, bill from nostril 26); the yellow frontlet smaller; supraloral part of forehead black, reaching almost to the nostril, the yellow of the forehead intervening narrowly (C 2197, Tabukan, Gt. Sangi, and 3 others).

Distribution. Great Sangi (Rosenberg *c 1*, Meyer *e 2*, Fischer *d 1*, *d 5*, Bruijn *d 3*, *d 6*, Platen *e 3*, Nat. Coll.).

Oriolus formosus — sangirensis.

Observations. The islands of Tagulandang, Ruang and Biarro, lying between the Minahassa and Siao, are inhabited by *O. formosus*, but we find it impossible to point to distinct racial differences, though the Biarro bird may be somewhat small. The yellow frontal patch of adult males resembles that of the Great Sangi race in shape, but generally runs larger; in one specimen (C 13476) from Tagulandang it is, however, more reduced than in any example from Great Sangi. The twelve examples recently received from our native collectors show that individual variation is considerable, and settled local characters do not seem to have come into existence at the present date.

The species.

Adult. Forehead bright yellow; rest of head above, sides of head, and in front of and below the eyes black; upper-parts, including wing-coverts, dark greenish yellow, becoming bright yellow on hind neck next the black of head, and on rump and upper tail-coverts; wings, with primary-coverts and bastard wing, black, the inner quills washed with the colour of the back, the outer ones greyish externally; centre tail-feathers black, washed with the colour of the back (in this specimen only on the basal half), tip yellow; remaining tail-feathers yellow, black at the base, the black increasing from less than $^1/_2$ the feather on the outermost to $^5/_6$ on the fifth pair; entire under-parts, including under wing- and tail-coverts, deep gamboge-yellow, with a few black hair-streaks on the malar region, chin and throat; quills below dusky drab, paler where they rest upon the body (Siao,

26. VI. 93: Nat. Coll. — C 12616). Iris light brown, bill flesh-colour, feet grey-black (Platen *e 3* — ♀ Gt. Sangi).

Young. Darker and duller above than the adult; head greenish dusky passing into ochre-yellow on the crown and forehead; wing-coverts yellowish olive tipped with ochre-yellow; centre tail-feathers yellow-olive, tipped with yellow, the bases of the others yellow-olive, blacker along the shaft; below pale ochre-yellow, darker on throat, with blackish shaft-streaks on breast and sides of jugulum (Siao: Meyer — C 915).

Iris brown-red or light brownish black (♀, Sangi, Platen *e 3*).

Skins of adults have a pale bill and blackish feet, of young birds a dark bill and pale feet.

Female. The female appears to be rather small, judging from 3 discussed by Prof. W. Blasius *e 3*.

Measurements.	Wing	Tail	Tarsus	Bill from nostril
a. (C 2197) ad., Gt. Sangi (Meyer)	168	130	30	27
b. (C 12681) ad., Gt. Sangi, 14. VII. 93 (Nat. Coll.)	170	130	—	26
c. (C 12679) ad., Gt. Sangi, 27. VII. 93 (Nat. Coll.)	166	130	28	25
d. (Tring Mus.) ad., Gt. Sangi, 14. VII. 93 (Nat. Coll.)	165	127	29	26
e. (Tring Mus.) imm., Gt. Sangi, 19. VII. 93 (Nat. Coll.)	159	130	29	26
f. (C 12680) imm., Gt. Sangi, 29. VII. 93 (Nat. Coll.)	159	122	29	24
g. (C 2199) imm., Gt. Sangi (Meyer)	165	124	29	—
h. (C 12616) ad., Siao, 26. VI. 93 (Nat. Coll.)	178	138	30	27
i. (C 12615) ad., Siao, 26. VI. 93 (Nat. Coll.)	172	140	30	26.5
j. (Tring Mus.) ad., Siao, 19. VI. 93 (Nat. Coll.)	170	134	29	26
k. (Tring Mus.) ad., Siao, 3. VII. 93 (Nat. Coll.)	175	140	30.5	27
l. (C 12617) vix ad., Siao, 8. VII. 93 (Nat. Coll.)	167	130	32	28
m. (C 2196) vix ad., Siao (Meyer)	165	130	30	—
n. (C 2200) imm., Siao (Meyer)	170	130	28	26.5
o. (C 2198) imm., Siao (Meyer)	163	133	30	26
p. (C 915) juv., Siao (Meyer)	163	134	29.5	23.5
q. (C 13472) ad., Tagulandang, Aug. 1894 (Nat. Coll.)	164	130	29	26.5
r. (C 13473) ad., Tagulandang, Aug. 1894 (Nat. Coll.)	169	130	30	27
s. (C 13474) vix ad. aut ♀, Tagulandang, Aug. 1894 (iid.)	168	130	29	26.5
t. (Tring Mus.) ♂ vix ad. aut ♀, Tagulandang, Aug. 1894 (iid.)	171	126	29	26.5
u. (Tring Mus.) vix ad., Tagulandang, Aug. 1894 (iid.)	169	—	29	26.5
v. (C 13476) ad., Ruang, Aug. 1894 (Nat. Coll.)	173	133	29	27
w. (C 13477) ad., Ruang, Aug. 1894 (Nat. Coll.)	167	130	29	26
x. (C 13475) ♂ vix ad. aut ♀, Ruang, Aug. 1894 (N. C.)	163	—	29	26
y. (Tring Mus.) ad., Ruang, Aug. 1894 (Nat. Coll.)	174	130	—	26
z. (Tring Mus.) vix ad., Ruang, Aug. 1894 (Nat. Coll.)	161	130	29	26.5
a'. (C 13478) ad., Biarro, 3. Sept. 1894 (Nat. Coll.)	163	126	27.5	26
b'. (Tring Mus.) ad., Biarro, 4. Sept. 1894 (Nat. Coll.)	166	121	28	26

Skeleton.

Length of cranium	67.0 mm	Length of tibia	47.1 mm
Greatest breadth of cranium	25.0 »	Length of tarso-metatarsus	30.3 »
Length of humerus	39.4 »	Length of sternum	36.0 »
Length of ulna	47.9 »	Greatest breadth of sternum	27.0 »
Length of radius	42.0 »	Height of crista sterni	11.1 »
Length of manus	44.8 »	Length of pelvis	46.5 »
Length of femur	34.2 »	Greatest breadth of pelvis	28.8 »

The *typical O. formosus* of Siao remains slightly the largest of all known Orioles, though very nearly equalled by its near relation *O. melanisticus* of Talaut, which exceeds it in length of bill. The latter curious bird — when its melanistic hues are not pronounced — may be distinguished from *O. formosus* by its black wings and two middle tail-feathers, on which the yellow-olive of the back is absent, or present in only a small amount.

Schlegel united *Oriolus formosus* with the Philippine *O. acrorhynchus* Vig., a species distinguished by its much smaller size, its large yellow frontlet covering most of the crown, and its lighter greenish yellow back. *O. frontalis* Wall., of Sula, also united by Schlegel with *A. acrorhynchus*, is more like *O. formosus*, a very little smaller, but golden yellow on the back, not dark greenish yellow.

This species is another example of the increase in size of birds in the Sangi Islands.

Several specimens, killed in June—July, are moulting.

* 250. ORIOLUS MELANISTICUS M. & Wg.

Talaut Oriole.

Plate XXXVII.

Oriolus melanisticus *(1)* M. & Wg., J. f. O. 1894, 247; *(2)* Rothsch., Bull. B. O. C. 1894, Nr. 19, Ibis 1894, 547; *(3)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 9, p. 7.

"Tariawo" or **"Ariawu"**, Talaut, Nat. Coll.

Adult. Like the adult *O. formosus*, but the wings and two middle tail-feathers entirely, or almost entirely black; a broad yellow collar round hind neck (about 40 mm wide), sometimes mixed with black; back varying from yellow-olive, with a few dark centres to the feathers, to almost perfect black with slight fringes of yellow-olive; bill a little longer than in *O. formosus* (type, Salibabu, 30. X. 93 and 4 others: Nat. Coll.). Bill in the skin reddish white, feet purplish black.

Immature. We hold the specimens with the least black on the back for females or immature.

Young. Very like the young of *O. formosus*, but the feathers on the back with dark centres, wing-coverts blackish with yellowish tips (juv., Kabruang, 7. XI. 93: Nat. Coll. — C 13113).

Measurements.	Wing	Tail	Tarsus	Bill from nostril
a. (C 13115) ad., Salibabu, 30. X. 93 (Nat. Coll.) . .	163	124	26	28
b. (C 13110) ad., Kabruang, 9. XI. 93 (Nat. Coll.) . .	170	122	28	27.5
c. (C 13112) ad. [? ♀], Kabruang, 2. XI. 93 (Nat. Coll.)	173	125	29	29
d. (C 13114) ad. [? ♀], Salibabu, 31. X. 93 (Nat. Coll.)	161	120	—	27
e. (C 13111) ad. [? ♀], Kabruang, 9. XI. 93 (Nat. Coll.)	165	122	29	27.5
f. (C 13113) juv., Kabruang, 7. XI. 93 (Nat. Coll.) .	156	113	—	25.5
7 adults from Karkellang, Nov. 1894, and autumn, 1896	165–171	—	—	27—30

Average size from 5 adults: wing 166.4, tail 122.6, tarsus 28; bill fr. nostr. 27.8.

Individual variation. Specimens, apparently adult, vary in having the back and upper wing-coverts yellow-olive to black. Yellow covers nearly the whole of the forehead in some examples, in others it is reduced to a small amount in the middle of the forehead and at the base of the bill. The yellow collar covers the entire hind neck and

upper portion of the mantle in some, especially the most melanotic examples; in others there is only a narrow space of yellow below the black of the nape. One specimen — from its darker bill scarcely adult — is especially mottled with black centres to the feathers above, and with black streaks on the throat. Those which are blackest above are generally most clear of black streaks on the yellow below.

In none of the specimens unfortunately has the sex been ascertained. It appears very likely that the most melanotic specimens will prove to be old males. No young specimens (with duskier bills) are melanotic.

Distribution. Talaut Islands: Karkellang, Kabruang and Salibabu (Nat. Coll. in Dresden and Tring Mus.).

This interesting Oriole seems to be sprung from the Sangi Islands' Oriole, *O. formosus*, and not *O. formosus* from it. *O. melanisticus* seems to be in process of acquiring a black back, and at present it appears to be an unusually variable and instable species, the colour of the back ranging from bright yellow-olive to almost black. The former colour indicates immaturity and, probably, the female sex, though unfortunately we know nothing positively on the latter point; the similarity of these specimens with the Sangi species suggests that the two races were formerly identical and that the melanistic influence has recently asserted itself in Talaut. Three of the ten known peculiar species of Talaut display an increase of black in certain parts of their plumage; *Pitta inspeculata* has the quills black, having lost, or nearly lost, the white speculum; the *Dicaeum* is blacker on the under surface than its Sangi and Celebes allies; *O. melanisticus* is much blacker than its nearest ally of Sangi; but, on the other hand, the black has decreased in amount on the wings of *Eos histrio talautensis*, the black wing bands being narrower than in the typical form of Sangi.

ORDER COLUMBAE.

Perhaps the best external means of distinguishing a Pigeon from other birds is furnished by its bill, which is about as long as the head — more or less, the basal portion fairly straight, soft, and covered by a skin in which the nostrils open, while the tip is formed of a hard and horny rhamphotheca or "nib". The shafts of the contour-feathers are thick, the webs at the base disintegrated and very woolly, forming a dense plumage; no aftershaft.

The toes are normal, three in front and one behind; the tarsus is covered with a network of scales behind, usually scutellated in front, but sometimes irregularly scaled *(Starnoenas, Goura)*. In other respects some Pigeons are much like certain Cuckoos in external appearance; others resemble somewhat the Game-birds and Sand-grouse. A strong point of difference between them and the two latter families is that the young of Pigeons are hatched blind and naked,

and are fed on a secretion from the crop of their parents. They lay white eggs, usually two in number, either in holes in trees or rocks, or in lightly-built open nests in trees or bushes. They are vegetable-feeders, furnished with a large crop.

The Pigeons vary in size from that of a Lark *(Geopelia)* to that of a small Goose *(Goura)*, and are of cosmopolitan distribution.

For anatomical particulars see: Gadow in Bronn's Klassen u. Ord. 1893, vol. VI, pt. 4, II, pp. 210—212, Salvadori, Cat. B. XXI 1893, pp. 1, 2[1]), and Meyer, Abb. v. Vogelskeletten, vol. I—II, 1879—1897.

Count Salvadori recognises 5 families of the suborder *Columbae*, of which the *Gouridae* of Papuasia and the *Didunculidae* of Samoa are more aberrant from one another and from the other families, *Treronidae*, *Columbidae* and *Peristeridae*, than the latter are among themselves.

The three latter are represented in Celebes.

FAMILY TRERONIDAE.

Tree-pigeons, distinguishable from the Ground-pigeons by having the tarsus generally shorter than the middle toe, from the *Columbidae* by the much broadened soles of the toes, by the tail of 14 rectrices (except in 3 genera not occurring in Celebes); tarsus feathered for more than half of its length (Salvad.). They are chiefly fruit-eaters. Salvadori subdivides the *Treronidae* into three subfamilies, of which the *Treroninae* have the bill rather stout, with a large raptorial-looking nib, longer than the bare soft basal portion. In the *Ptilopodinae* and *Carpophaginae* the bill is more slender, the nib less hooked and not so large; the former are small, with brightly contrasting patches of colour, the latter a large species of less varied plumage.

GENUS OSMOTRERON Bp.

General colour green. Supranasal plumes not quite reaching to the base of the nib of the bill. Third primary longest, with the inner web deeply scooped out about the middle, where it is hardly wider than the outer web. Tail of 14 feathers, slightly rounded, rather short, the under coverts reaching nearly to its tip. Ranges from India south-east as far as Buru and Timor.

* 251. OSMOTRERON WALLACEI Salvad.

Green Dove.

a. **Treron griseicauda** *(1)* Wall. (nec Gray), P. Z. S. 1862, 335, 344; *(2)* id., Ibis 1863, 319; *(3)* id., ib. 1865, 376; *(4)* Finsch, Neu Guinea 1865, 176; *(5)* Schl., Ned.

[1]) Gadow and Salvadori state that Pigeons have eleven primaries! There are ten in *Turtur* and *Macropygia*.

Tdschr. Dierk. 1866, III, 211, pt. (Celebes, Sula); *(6)* id. Mus. P.-B., Columbae, 1873, 54, 55, pt. (Celebes, Sula); *(7)* Brügg., Abh. Ver. Bremen 1876, V, 79; *(8)* Büttik., Zool. Erg. Weber's Reise in Ost-Ind. 1893, III, 287.

b. **Osmotreron griseicauda** *(1)* Wald. (nec Gray), Tr. Z. S. 1872, VIII, 82; *(2)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 670; *(3)* Lenz, J. f. O. 1877, 376; *(4)* Meyer, Ibis 1879, 134, 146; *(5)* Legge, B. Ceylon 1880, 729; *(6)* W. Blas., Ztschr. ges. Orn. 1885, 301; *(7)* id., Ornis 1888, 611; *(VIII)* Meyer, Abb. v. Vogelskel. II, 1892, 49, pl. CLXXIV.

c. **"Treron sulaensis** (Schleg.)" fide Oust., Nouv. Arch. Mus. (2) VIII, 1885, 291.

d. **Ptilopus griseicauda** *(1)* Rosenb., Malay. Archip. 1878, 275.

Osmotreron wallacei *(1)* Salvad., Cat. B. XXI, 1893, 42 pl. II; *(2)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 14; *(3)* iid., ib. 1896, Nr. 2, p. 19; *(4)* Hart., Nov. Zool. 1896, 163; *(5)* id., ib. 1897, 165.

"Pombo idiu", (Green Dove) Malay name, Celebes (Meyer *b 4*).

"Wungull", Minahassa, Meyer *b 4*.

"Wakian kawang", Malay, Minahassa, Nat. Coll.

"Wakian laker laker", near Manado, iid.

"Puni puni", Tjamba Distr., Platen *b 6*.

"Sebut", Tonkean, E. Celebes, Nat. Coll.

"Bokelan", Peling; **"Mumut"**, Banggai, iid.

For further references cf. Salvadori *I*.

Figures and descriptions. Salvadori *I*; Meyer *b VIII* (skeleton); Wallace *a 1*, *a 2*; Legge *b 5*.

Adult male. Head above and malar region cinereous, becoming ochraceous apple-green on the ear-coverts, sides of occiput, nape, hind neck, throat and underparts, darker and greyer on nape and hind neck, yellower on the abdomen, sides of jugulum and throat; chin whitish; back, scapulars and inner lesser wing-coverts mealy maroon-purple, becoming dark lead-grey on the carpal region; exposed ends and edges of middle wing-coverts citron-yellow, the concealed bases greenish slaty; greater coverts and secondaries black, edged with yellow, most broadly on the coverts, the innermost quills olivaceous green on the outer web; primaries slaty black, with a slight whitish external seam; rump, upper tail-coverts and the two middle tail-feathers yellow-green (the tail-feathers having a black ground, therefore appearing darker); the other tail-feathers grey, with a blackish band about 3 cm from the tip; thighs yellow-green and white; under tail-coverts dull vinaceous rufous, the shorter ones broadly tipped with whitish; under wing-coverts and quills below slaty, blackish near the shafts, the outermost two or three blackish externally (♂, Kalibangkere, S. Celebes, 25. III. 78: Platen — C 13234).

Iris yellow; feet red; claws grey; bill greenish black (Meyer *b 4*); iris orange-red; feet light cherry-red; bill horn-yellow-grey (Platen *b 6*).

Female. Differs from the male in having the back and inner wing-coverts yellow-green like the rump, not mealy maroon; the borders of the middle wing-coverts white, of the greater coverts pale yellowish; under tail-coverts white, irregularly barred with green and olive-greyish (♀, S. Celebes: C 13235). "Iris golden; feet red; bill yellow-green, darker at the base" (P. & F. Sarasin, ♀ Kema).

The male in first plumage probably resembles the adult female. (See young male of *O. sangirensis*.)

Measurements.	Wing	Culmen (horny terminal portion)	Tarsus
a. (C 13234) ad. ♂, Tjamba Distr., S. Cel., 25. III. 78 (Plat.)	151	12.5	22.5
b. (C 13235) ad. ♀, S. Celebes, 4. June	146	13.5	22.5
c. (Nr. 11207) ad. [♂], Minahassa (v. Faber)	150	14	23.5
d. (Nr. 13149) ad. [♂], Minahassa (v. Faber)	153	—	24
e. (Nr. 13112) ♀ aut ♂ vix ad., Minahassa (v. Mussch.)	141	13	22
f. (C 5222) ad. [♂], Minahassa (v. Mussch.)	149	14	22
g. (Sarasin Coll.) ad. ♂, Kotabangon, N. Cel., 2. XII. 93	144	13.2	23
h. (Sarasin Coll.) ad. ♀, Kema, 26. VII. 93	144	13.4	—
i. (C 2053) ad. ♀, Manado, III. 71 (Meyer)	146	12	21
j. (C 10889) ad. [♂], near Manado, Aug.-Sept. 92 (Nat. Coll.)	151	—	23.5
k. (C 10888) ad. [♀], near Manado, Aug.-Sept. 92 (Nat. Coll.)	150	13	24
l. (C 12287) ad. [♂], Manado tua Id., 8. IV. 93 (Nat. Coll.)	146	13.5	22.5
m. (C 12286) ad. [♀], Manado tua Id., 6. IV. 93 (Nat. Coll.)	148	11.5	22.5
n. (C 12284) ad. [♂], Mantehage Id., 26. IV. 93 (Nat. Coll.)	151	13.5	24.5
o. (C 12289) ad. [♀], Mantehage Id., 25. IV. 93 (Nat. Coll.)	152	13	21.5
p. (C 12285) ad. [♂], Banka Id., 17. V. 93 (Nat. Coll.)	150	13.5	24
q. (C 12288) ad. [♀], Banka Id., 12. V. 93 (Nat. Coll.)	150	12.5	22
r. (C 14493) ad. [♂], E. Celebes (Nat. Coll.)	147	—	—
s. (C 14608) ad. [♂], Peling, (Nat. Coll.)	150	—	—
t. (C 14734) ad. [♂], Banggai (Nat. Coll.)	146	—	—

Skeleton.

Length of cranium . . .	51.0 mm	Length of tarso-metatarsus	24.5 mm
Greatest breadth of cranium	19.6 »	Length of digitus III . .	33.0 »
Length of humerus . . .	39.0 »	Length of sternum . . .	49.0 »
Length of ulna	45.0 »	Greatest breadth of sternum	38.0 »
Length of radius	40.0 »	Height of crista sterni . .	19.0 »
Length of manus	49.5 »	Length of coracoid . . .	33.4 »
Length of metacarpus . .	25.0 »	Length of scapula	39.0 »
Length of digitus principalis	23.8 »	Length of clavicula . . .	33.7 »
Length of femur	38.0 »	Length of pelvis	58.0 »
Length of tibia	49.0 »	Greatest breadth of pelvis .	36.5 »
Length of fibula	36.0 »		

Egg. White. "An egg taken by Dr. Platen at Rurukan (Minahassa) measures 28 × 21.5 mm" (Nehrkorn MS.).

Distribution. Celebes, the islands off the coasts, and Sula. — Sula Besi and Sula Mangoli (Allen *a 1*, Bernstein, Hoedt *a 6*); Peling and Banggai (Nat. Coll. in Dresd. and Tring Mus.); Togian (Meyer *b 4*); Banka, Lembeh, Mantehage and Manado tua (Nat. Coll.); Minahassa (Rosenberg *a 6*, etc.); Bolaang Mongondo Distr. (P. & F. Sarasin); Gorontalo Distr. (Rosenb. *a 6*, Meyer *b 4*); West Celebes (Doherty *5*); Tonkean, E. Peninsula (Nat. Coll. in Dresd. and Tring Mus.); Tjamba Distr. (Platen *b 6*); Bonthain Distr. (Ev. *3*); Macassar (Wall. *1*); Saleyer (Weber *a 8*, Ev. *3*).

The following has been separated as a subspecies by Mr. Hartert:

Osmotreron wallacei pallidior.

Hartert, Nov. Zool. 1896, 178.

Diagnosis. Like northern specimens of the *typical O. wallacei*, but "larger, with a stronger

bill and a little longer wing, the head paler grey, the throat lighter and a little more washed with grey, the entire breast and abdomen of a paler green, the anal region more white, and the under tail-coverts slightly paler. The brownish orange spot (?) in front of the shoulders is very much paler and occupies a larger area" (Hartert).

Measurements. Wing 157—161 mm; tail 95—98; tarsus 20—22; bill from hind end of nostril to tip 16—17; height from angle of mandible 9 (Hartert).

Distribution. Djampea and Kalao (Everett).

The typical specimens of this species were obtained by Mr. Wallace in the Southern Peninsula of Celebes near Macassar. Specimens from the Northern Peninsula appear to us to differ very slightly, having the grey of the head carried a little further back on to the nape, and the back a shade darker mealy maroon-purple in the male, or a shade darker green in the female. Count Salvadori remarks that females from the Sula Islands have the edges of the median and greater wing-coverts and secondaries yellowish white, instead of white, with a slight green tinge along the very edges, but this character varies somewhat in Celebesian birds; as a rule the median covert edges are white, the others more or less entirely pale ochre-yellow. The birds from Djampea and Kalao seem from Mr. Hartert's description and measurements to represent a well marked local race.

The Celebes Green Dove is extremely closely related to *O. sangirensis*, which differs chiefly by its larger size and larger bill, and to *O. griseicauda* of Java (and Kangean according to Vorderman, N. T. Ned. Ind. LII 1893, 202) which Count Salvadori, following Mr. Wallace, distinguishes chiefly by its having the dark band across the tail not blackish, but grey and ill-defined, and the size slightly smaller (wing 140 mm).

The Green Dove is a common species according to Meyer's observations, in the Minahassa, the Gorontalo district, and in South Celebes. It feeds on fruits, waringin (figs) and others; flies singly and very quickly, not in flocks or pairs. Its cry is "Koowoo, koowoo", sad and howling; hence old folks say to little children who whine that they are just like this bird *(b 4)*.

* 252. OSMOTRERON SANGIRENSIS (Brügg.).

Sangi Green Dove.

a. **Treron griseicauda** *(1)* Schl., Ned. Tdschr. Dierk. 1866, III, 211, pt.; *(2)* Gray, HL. II, 1870, 222, Nr. 9080, pt.; *(3)* Schl., Mus. P.-B., Columbae, 1873, 55, pt.

b. **Treron sangirensis** *(1)* Brügg., Abh. Ver. Bremen 1876, V, 79.

c. **Treron sanghirensis** *(1)* Salvad., Ann. Mus. Civ. Gen. IX, 1876, 60; *(2)* Meyer, Isis, Dresden 1884, 6.

d. **Osmotreron sanghirensis** *(1)* W. Blas., Ornis 1888, 611, 642; *(2)* Salvad., Cat. B. XXI, 1893, 43.

"Banggu masaria", Great Sangi; **"Wakian sinkawang"**, Siao; **"Karawea"**, Tagulandang, Nat. Coll.

Descriptions. Schlegel *a 1, a 3*; Salvadori *c 1, d 2*.

Diagnosis. ♂. Like *O. wallacei* Salvad., ♂, of Celebes, but larger, the bill relatively larger and more robust, the hind head and nape grey like the crown, the back and scapulars a shade darker mealy maroon-purple; middle of chin and throat greyer, less yellow-ochraceous (Gt. Sangi, C 12656; Siao, C 12641; Tagulandang, C 13501).

Female. Like *O. wallacei* ♀, but larger, and with a bigger bill, the hind head generally greyer, the chin and throat more tinged with grey (Gt. Sangi, C 12657; Siao, C 12639; Tagulandang, C 13502).

Young male. Like the adult female; the back and scapulars with feathers of dark vinaceous purple as in the adult male intermingled, the wing-coverts and inner quills edged with yellow (Tagulandang [♂], C 13500).

Measurements.	Wing	Culmen (horny terminal portion)	Tarsus
a. (C 12656) ad. [♂], Gt. Sangi, 20. VII. 93 (Nat. Coll.)	164	14.5	25.5
b. (Nr. 13148) ad [♂], Gt. Sangi (Meyer)	164	16	25.5
c. (C 12657) ad. [♀], Gt. Sangi, 20. VII. 93 (Nat. Coll.)	160	15	24
d. (C 12657) ad. [♀], Gt. Sangi, 24. VII. 93 (Nat. Coll.)	159	14.5	24.5
e. (C 12640) ad. [♂], Siao, 5. VII. 93 (Nat. Coll.) . .	165	15	24
f. (C 12641) ad. [♂], Siao, 29. VI. 93 (Nat. Coll.) . .	155	15	24.5
g. (C 12639) ad. [♀], Siao, 2. VII. 93 (Nat. Coll.) . .	162	14.5	24.5
h. (Nr. 13145) ad. [♀], Siao (Meyer)	157	14.5	23
i. (Tring Mus.) ad. [♂], Tagulandang, 4. VIII. 91 (Nat. Coll.)	158	15	24
j. (C 13501) ad. [♂], Tagulandang, 20. VIII. 94 (Nat. Coll.)	159	14.5	24.5
k. (C 13502) ad [♀], Tagulandang, 6. VIII. 94 (Nat. Coll.)	160	14.5	25
l. (C 13500) imm. [♂], Tagulandang, 2. VIII. 94 (Nat. Coll.)	160	14	24
For further measurements: cf. W. Blas. *d 1.*			

Distribution. Sangi Islands: Great Sangi (Rosenb. *a 3*, *d 1*, Hoedt *a 3*, Platen *d 1*, Nat. Coll.); Siao (Hoedt *a 3*, Duivenb. *a 3*, Nat. Coll.); Tagulandang (Nat. Coll.).

Extremely near as this form stands to *O. wallacei* of Celebes, it is not known to intergrade with it, individual variation running within narrow limits. Birds from Tagulandang probably average two or three millimeters smaller than those of Great Sangi, but they appear to be otherwise identical with them; those from Banka, Mantehage and Manado tua Islands are, on the other hand, about a centimeter shorter in the wing and cannot be separated from *O. wallacei*. Truly intermediate specimens we have not been able to find, the smallest Siao bird (wing 155) having the bill larger than in any Celebes specimen. This species seems to be absent in Talaut.

253. OSMOTRERON VERNANS (L.).

Grey-tailed Green Dove.

a. **Columba vernans** *(1)* Linn., Mant. 1771, 526.

b. **Treron vernans** *(1)* Steph., Gen. Zool. 1826, XIV, I, 274; *(2)* Schl., Mus. P.-B., Columbae, 1873, 49; *(3)* Salvad., Cat. Ucc. Borneo 1874, 286; *(4)* Rosenb., Malay. Archip. 1878, 275; *(5)* Büttik., Notes Leyden Mus. 1887, 75, 95; *(6)* Everett, J. Str. Br. R. A. S. 1889, 196; *(7)* Vorderman, N. T. Ned. Ind. 1890, L, 501; *(8)* Sh. & Whtd.,

Ibis 1890, 134; *(9)* Büttik., Zool. Erg. Weber's Reise in Ost-Ind. 1893, III, 281; *(10)* Vorderman, N. T. Ned. Ind. 1893, LII, 202.

c. **Treron viridis** (Scop.), *(1)* Wall., Ibis 1865, 374.

Osmotreron vernans *(1)* Bp., Consp. II, 1854, 12; *(II)* id., Icon. des Pig. 1857, pl. XIII; *(3)* Wald., Tr. Z. S. VIII, 1872, 81, 113; *(4)* Hume & Davis., Str. F. 1878, VI, 411; *(5)* Hume, t. c. 414; *(6)* Legge, B. Ceylon 1880, 726; *(7)* Kelham, Ibis 1881, 526; *(8)* Salvad., Orn. Pap. III, 1882, 3; *(9)* Oates, B. Brit. Burmah 1883, II, 309; *(10)* Guillem., P. Z. S. 1885, 268, 416, 509; *(11)* W. Blas., Z. ges. Orn. 1886, 127; *(12)* Salvad., Ann. Mus. Civ. Gen. 1886, (2) IV, 523, 557; *(13)* Whitehd., Ibis 1890, 56; *(14)* Steere, List Coll. B. & M. Philipp. Is. 1890, 24; *(15)* Oates, ed. Hume's Nests & Eggs Ind. B. 1890, II, 375; *(16)* Salvad., Ann. Mus. Civ. Gen. 1891, (2) XII, 73; *(17)* id., Cat. B. XXI, 1893, 60; *(18)* Sharpe, Ibis 1894, 242, 257; *(19)* Steere, t. c. 418; *(20)* Hartert, Nov. Zool. 1894, 482; *(21)* Bourns & Worces., B. Menage Exp. 1894, 29; *(21bis)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 2, p. 19; *(22)* Hart., Nov. Zool. 1896, 163, 572, 594; *(23)* id., ib. 1897, 165.

d. **Osmotreron viridis** *(1)* Hume, Str. F. 1873, I, 461; *(2)* A. Müll., J. f. O. 1882, 430.

For further synonymy and references cf. Salvad. *17*.

Figure and descriptions. Bonaparte *II*, *1*; Hume *d 1*, *4*; Schlegel *b 2*; Oates *9*; Salvadori *17*.

Adult male. Saturate pea-green; head, neck all round and jugulum dark grey, washed on the forehead, sides of head, chin and middle of throat with greenish, on neck and jugulum with vinaceous; quills black; the greater wing-coverts and tertiaries green, broadly bordered with pale yellow; tail-feathers slate-grey, with a subterminal band of black, narrowest on the middle feathers, terminal margin slate-grey; tail below black, tipped with grey; on breast a broad patch of bright ochraceous; sides of body and the under wing-coverts and quills below (except a blackish portion next the shaft) slate-grey; abdomen greenish yellow; crissum yellow; flanks yellow, mixed with dark green and grey; under tail-coverts chestnut (♂, Palawan, 7. XI. 87: Platen — Nr. 12535).

"Iris composed of rings of yellow, pink and blue; bill green; feet dull pink" (Borneo, Whitehead *b 8*).

Measurements. Wing 147 mm; tail 100 c.; tarsus 21.5; bill from feathers of forehead 15.

Female. Differs from the male in having the head and neck all round green, washed with yellow on forehead, sides of head and throat; under tail-coverts reddish white, becoming cinnamon-chestnut towards the middle of the feathers; no orange patch on breast (♀, Palawan, 11. X. 87: Platen — C 12536).

Young male. Resembles the female, but with some trace of the vinaceous purple colour on the neck, and of the brown orange on the breast (Salvad. *17*; [♂] imm. Mantehage, April 93: Nat. Coll. — C 12290).

Young female. Has the rufescent colour of the upper tail-coverts scarcely visible, and the central tail-feathers more or less tinged with green (Salvad. *17*).

Egg. "An egg taken in Salanga Id. measures 26 × 20.5 mm" (Nehrkorn MS.). Two in number, white, 28 × 19 mm (Labuan — Whitehead *b 8*). Two in number, of a delicate pink colour, but white when blown (Perak — Kelham *7*). Ovals — moderately broad to considerably elongated, obtuse at one end, often at both, pure white, with little gloss (Tenasserim and Malay Penin. — Hume *15*).

Nest. Small, flat, loosely put together, composed of dry twigs, 6 to 10 feet from the ground in bushes in swampy valleys (Perak — March, Kelh. *7*). Davison (Tenasserim) and Whitehead (Labuan) similarly describe it as nesting in bushes or shrubs.

Distribution. Siam (Mouhot *17*); Cochin China (Brit. Mus. *17*); Cambodia (Brit. Mus. *17*); Tenasserim (Davison *4*, *9*, *17*); Malay Peninsula (Wall., Darling, etc. *17*, Kelh. *7*); Sumatra (Raffles *b 3*, etc.); Banka (v. d. Bossche *b 2*); Billiton and Mendanau (Vorderman *b 7*); Natuna Is. — Sirhassen and Bunguran (Everett *20*); Borneo (Mottley etc. *b 6*); Philippine Is., incl. Palawan and Sooloo (Brisson *b 3*, Meyer, Everett, Platen, Steere etc. *17*, *14*, *13*, *21*); Celebes: — Mantehage Id. (Nat. Coll. Dr. Mus.), Gorontalo Distr. (Forsten *b 2*, Rosenb. *b 2*, Riedel *11*), West Celebes (Doherty *23*), East Celebes, Tonkean (Nat. Coll.), Luwu at the head of the Gulf of Boni (Weber *b 9*), Tanette (Weber *b 9*), Macassar (Wallace *17*), Bulekomba (Everett); Kangean Is. (Vorderman *b 10*); Java (Horsfield *b 3*, *17*, Boie *b 2*, etc.); Lombok (Everett *22*); Sumbawa (Guillemard *10*, Doherty *23*).

Prof. W. Blasius rightly remarked in 1886 that it was strange that no fresh-killed specimens of this species from Celebes had come into the hands of recent writers on the birds of the island. Latterly, however, two examples from South Celebes have been recorded by Mr. Büttikofer, and among a great number of *O. wallacei* sent to the Dresden Museum from the Minahassa and the islands off the coast by our native collectors only a single young male of *O. vernans* was found. There is another from East Celebes, and Doherty and Everett obtained it in the West and South of the island. It is probable that the species is not particularly scarce, or becoming scarce, in the island, but that most travellers have not visited its favourite haunts. Dr. Riedel's collection was made in Gorontalo, not in the Minahassa as is said by Prof. W. Blasius. All of von Rosenberg's specimens in the Leyden Museum were obtained in the Gorontalo District, which had not been visited by ornithological collectors since Meyer was there in 1871, until the Drs. Sarasin went to the place in 1893, but the latter did not obtain this species anywhere in Celebes. Dr. Steere *(19)* says that the maroon-backed *O. axillaris* Bp. (the Philippine representative of *O. wallacei*), is arboreal, feeding in the high trees in flocks; *O. vernans*, on the other hand, inhabits thickets, where it feeds from the bushes or on the ground, and is found singly or in pairs. Kelham, who gives a good account of the habits of *O. vernans* in the Malay Peninsula, describes it as being particularly plentiful about the well-wooded islands to the south of the Peninsula. The birds have their favourite roosting-places, clumps of trees to which they pass regularly every evening before sunset; they are fond of the large hard berry of a tree which grows plentifully in the Straits. Similarly Mr. Whitehead *(13)* describes them as common on the more open spaces in Palawan, frequenting the small clumps of trees found in the plains. They nest, as already noticed, in bushes or low trees.

O. vernans is very closely related to *O. bicincta* (Jerd.) of India and Ceylon to Siam and Malacca. The latter bird is larger, has a broader band across the tail, the head of the male mostly green, no vinous on the hind neck; Davison observes, moreover, that its note is less soft than that of *O. vernans*, which occurs in Tenasserim in common with it. No doubt, therefore, the two species are

distinct. In Celebes its compatriot, *O. wallacei*, may be distinguished from it by its two middle tail-feathers being yellow-green, not grey with a subterminal bar, by the blackish bar crossing the other tail-feathers near the middle in *O. wallacei* and close up to the end in *O. vernans*, by the larger bill of *O. wallacei* and, in the males of that species, by the green neck, maroon back, and by the absence of the orange patch.

Local differences in *O. vernans* have been suggested and species named accordingly, but Count Salvadori, after an exhaustive study of the literature and 130 specimens in the British Museum, unites them again, remarking that "some specimens have the forehead and throat more or less tinged with greenish, but they are not confined to a particular locality".

GENUS PTILOPUS Sw.

The Painted Pigeons vary in size from the dimensions of a small Thrush to those of a Rock-dove. The tarsus is feathered almost to the foot. Wing moderate, relatively shorter than in *Osmotreron* and *Carpophaga*. Tail rounded, shorter than the wing, 14 rectrices (in one subgenus 16). Colour chiefly green, patches of other bright tints generally occurring on the head, throat, breast, or elsewhere. In two of the three subgenera occurring in Celebes, *Leucotreron*, and *Lamprotreron* the first primary is suddenly attenuated in its terminal third, and to some extent in the subgenus *Ptilopus* also.

The genus ranges from the Malay Peninsula throughout the Archipelago to Australia and the high islands of Polynesia.

* 254. PTILOPUS FISCHERI (Brügg.).

North Celebes Red-eared Fruit-pigeon.

a. **Ptilinopus fischeri** *(1)* Brügg., Abh. Ver. Bremen 1876, V, 82, pl. IV.

Ptilopus fischeri *(1)* Elliot, P. Z. S. 1878, 571; *(2)* Meyer, Ibis 1881, 170, part. (N. Cel.); *(3)* W. Blas., J. f. O. 1883, 120, 121 pt.; *(4)* Salvad., Cat. B. XXI, 1893, 74; *(5)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 15.

b. **Ptilopus (Rhamphiculus) fischeri** *(1)* Oust., Naturaliste 1880, 324; *(2)* Rchw. & Schalow, J. f. O. 1881, 76; *(3)* Oust., Nouv. Arch. Mus. 1885, (2) VIII, 304.

c. **Leucotreron fischeri** *(1)* P. & F. Sarasin, Z. Erdk. Berlin 1895, XXX, 229.

Figure and descriptions. Brüggemann *a I*; Elliot *1*; Salvadori *4*.

Adult male. General colour above bright grass-green, the lower back brighter; head above and nape whitish grey; a patch in front of and below the eye, on ear-coverts and sides of occiput dark maroon-purple, joining a collar round hind neck of dark slate; hind neck and mantle dark grey, passing into the green of the back, rather lighter grey on sides of neck, jugulum and upper breast; chin and malar region white, buffy on upper throat; lower breast greenish ochraceous; abdomen and flanks darker green, with buff terminal fringes to the feathers; thighs and tarsi greenish slaty, buff on hinder side; under tail-coverts buff-white, grey-green on

the inner part of the inner webs; quills black, the primaries narrowly edged with white, the exposed parts of secondaries green, the outer secondaries narrowly edged with yellow; under wing-coverts and quills below slate-grey, the former greenish; tail above green, the outer feathers blackish, with the terminal 3 cm greenish grey. "Iris sepia; bill green; feet cherry-red, soles brown-yellow" (♂, Mt. Klabat, 6000 ft. circa, 23. Sept. 1893: P. & F. Sarasin).

Female. Similar to the male (Salvad. *4*).

Young. The grey of the head and of the nape tinged with green, no black band on the nape; the crimson patch on the sides of the head scarcely apparent; edges of the secondaries pale yellowish (Salvad. *4*, Brunswick Mus.).

Measurements.	Wing	Tail	Tarsus	Bill from feath. of forehead
a. (Sarasin Coll. Nr. 47) ♂ ad., Mt. Klabat	176	150	34	18
b. (Sarasin Coll. Nr. 224) ♂ ad., Tomohon, 8. IV. 94 .	180	—	—	18
c. (Nehrk. Coll. Nr. 904) ♂ ad., Rurukan, 14. IV. 85 .	183	160	—	17.5

Distribution. North Celebes: — the Minahassa (Fischer *a 1*), Rurukan (Platen), Mt. Klabat and Tomohon (P. & F. Sarasin); Mantinang Mts. (iid. *c 1*).

This rare species is as yet known only from the Northern Peninsula of Celebes. Dr. Brüggemann's type was obtained somewhere near Manado, and the author suggested that the bird might be a straggler from the interior of the island, a view which we were at first inclined to accept. But a whole series was obtained, as Mr. Nehrkorn informs us, by Dr. Platen near Rurukan in the mountains of the Minahassa, and it was found again in September, 1893, by the Drs. P. & F. Sarasin near the summit of Mount Klabat (circa 6000 ft.), again in the mountains of the Minahassa near Tomohon and again at about 3300 ft. on the Mantinang Mts. near Buol; it appears, therefore, to be a mountain-haunting bird, and its scarcity in collections is probably due to collecting difficulties. It is easily distinguishable from *P. meridionalis* of South Celebes by its bright grass-green back and wings. It has no other very near allies, *Ptilopus occipitalis* (Gray) of the Philippines being perhaps most like it, though this species is easily distinguishable by the crimson on its hind head and lower breast and its ochraceous jugulum and chest.

In many species of the genus *Ptilopus*, but by no means in all (cf. Elliot, P. Z. S. 1878, 508), the first primary is abruptly attenuated for the terminal 15—25 mm ca., much as is seen in so many species of the *Bucerotidae*, in some of the *Paradiseidae*, as well as in many other Pigeons. In the case of the Hornbills this peculiarity led us to make some inquiries into the flight of these birds, with the result that we found that a much attenuated first primary was accompanied by especially poor flying-powers and stationary habits. No such inference can be made from the *Ptilopodes*, which undoubtedly fly well and swiftly. But in the Pigeons, as in the Hornbills, it is seen that the attenuated tip lies on the under surface of the wing, where it must be submitted to friction and fretting with each stroke of the elastic quills above it. To this cause (attrition) which we have already cited as the correct explanation for the shape of many

feathers (*Prioniturus*, *Merops*), the shape of the first primary in *Ptilopus* etc., the *Bucerotidae*, and others, may with safety be ascribed. Pigeons rarely "sail" on outstretched wings, like Crows, many Birds-of-prey, Storks, etc., though in spring Wood-pigeons may often be seen doing so in play; they are more given to beating the air with short, quick strokes with the wing not fully expanded, or "shooting" through the air on half-closed wings, steering and turning with remarkable agility. In these evolutions the first primary, which roots in the terminal digit of the manus, is not stretched out, and is probably almost entirely covered by the succeeding quills; the attenuated tip of it, which turns inwards very much, certainly is so. Hence the reason why the first quill is more subjected to attrition from the quills in Pigeons than in many other birds.

Count Salvadori (Cat. B. 1893 XXI, p. 1) states that Pigeons have eleven primaries! We do not know from what Pigeon, or after what anatomist (unless Gadow), the Italian ornithologist makes this statement; certainly all the Pigeons we have examined have the number usual in the higher orders of birds — ten primaries, and *Ptilopus* is no exception to the rule. The outermost primary covert is present, though reduced, but we have failed to find any sign of the eleventh quill. No mention of the primary formula in Pigeons is made either by Gerbe, Jeffries, Goodchild, or Wray, but Gadow, like Salvadori, states that Pigeons have eleven primaries (Bronn's Kl. u. Ord. VI, pt. IV, Vög. II, p. 212, 1893).

* 255. PTILOPUS MERIDIONALIS M. & Wg.

South Celebes Red-eared Fruit-pigeon.

a. **Ptilopus fischeri** *(1)* Meyer (nec Brügg.), Ibis 1879, 135; *(II)* Gould, B. New Guinea V, pl. 56 (1880); *(3)* Meyer, Ibis 1881, 170, pt. (S. Cel.).

b. **Leucotreron fischeri meridionalis** *(1)* M. & Wg., Orn. Monatsb. Jan. 1893, 12.

Ptilopus meridionalis *(1)* Salvad., Cat. B. XXI, 1893, 74; *(2)* Hart., Nov. Zool. 1896, 163.

Figure and descriptions. Gould *a II*; Meyer & Wiglesw. *b 1.*

Adult. Like *P. fischeri* adult, but the entire back and wing-coverts greenish slate, not yellowish grass-green; the entire under surface (except flanks and under tail-coverts) light pinkish grey washed over with buff (not jugulum and breast dark grey, and abdomen ochraceous); head and nape-band darker than in *P. fischeri*, the red on sides of head also somewhat darker; hind neck and mantle darker; no buff on throat, which is white; bill somewhat shorter. Wing 172—175; tail 145; tarsus c. 28; bill from feathers of forehead 15.5 mm (type Macassar: Teijsmann, Nr. 1679).

Female. "Slightly more greenish above, a little more brownish below, and a little smaller. ♂ wing 172—175 mm, ♀ wing 165—166 m" (Hartert *2*).

"Iris orange-red; bill dark leaf-green; feet dull purplish; nails brownish plumbeous" (♀, Everett *2*).

Immature. A few green feathers interspersed on the shoulders and wing-coverts; lower back almost entirely green; under surface, especially near the vent, more ochraceous (Leyden Museum).

Distribution. Southern Peninsula of Celebes: — [near] Macassar (Teijsmann), Mt. Bonthain and surrounding hills, c. 2500—c. 6000 ft. (Everett *2*).

When young, this species, judging from an example kindly lent to us by the Leyden Museum, bears a plumage the green of which resembles that of *P. fischeri* of the Northern Peninsula; we are inclined to regard *P. meridionalis*, therefore, as an offshoot of *P. fischeri*, which has undergone strongly pronounced changes in the South of the island. In first describing the Southern form *(b 1)*, we made it a subspecies of *P. fischeri*; this step was premature as the two races are not yet known to intergrade, and we must wait for the series of intermediate birds, which the mountains of Central Celebes are pretty certain to furnish, before uniting these well-marked extremes.

Although said to have come from Macassar, there can be little doubt that this Pigeon, like *P. fischeri*, is a mountain-species, and that it was obtained in the high hills east or south of Macassar.

* 256. PTILOPUS GULARIS (Q. G).

Maroon-chinned Fruit-pigeon.

a. **Columba gularis** *(I)* Quoy & Gaim., Voy. Astrol. Zool. 1830, I, 247, pl. 29; *(II)* Prév. & Knip, Pig. 1838—41, pl. XI; *(3)* Schl., Handl. Dierk. 1857, 411.

b. **Ptilinopus gularis** *(1)* Less., Compl. de Buff. VIII, 1837, Ois. 39; *(2)* Brügg., Abh. Ver. Bremen 1876, V, 82; *(3)* Hart., Nov. Zool. 1897, 165.

c. **Leucotreron gularis** *(1)* Bp., Compt. Rend. XXXIX, 1854, 876; *(2)* id., Consp. II, 1854, 15; *(3)* Wald., Tr. Z. S. VIII, 1872, 83; *(4)* Salvad., Ann. Mus. Civ. Gen. 1875, 670; *(5)* Meyer, Ibis 1879, 135; *(6)* W. Blas., Z. ges. Orn. 1886, 131.

d. **Ptilonopus gularis** *(1)* Wall., Ibis 1860, 141; *(2)* id., Ibis 1861, 348; *(3)* id., Ibis 1865, 377, 396; *(4)* Finsch, Neu Guinea 1865, 176.

e. **Laryngogramma gularis** *(I)* Rchb., Tauben 1862, t. 233, f. 2197.[1])

Ptilopus gularis *(1)* Schl., De Dierent. 1864, 210; *(2)* id., Mus. P.-B., Columbae, 1873, 37; *(3)* Elliot, P. Z. S. 1878, 570; *(4)* Rosenb., Malay. Archip. 1878, 275; *(5)* Salvad., Cat. B. XXI, 1893, 78; *(6)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 15; *(7)* iid., ib. 1896, Nr. 2, p. 19.

"Pombo sangi" (Sangi Dove!), Malay, Minahassa, Meyer *c 5*.

"Wakian sangir", Malay, near Manado, Nat. Coll.

"Ririhan", near Manado, iid.

"Malomitti" [Gorontalo Distr.] v. Rosenb. *4*.

"Takuka ise ise", Tonkean, E. Celebes, Nat. Coll.

For further synonymy and references cf. Salvadori *5*.

Figures and descriptions. Quoy & Gaimard *a I*; Prévost & Knip *a II*; Reichenbach *e I*; Bonaparte *c 2*; Schlegel *2*; Salvadori *5*.

Adult male. Above bright grass-green (lit. between grass-green and parrot-green: Ridgway, pl. X, f. 1 & 4), primaries bluer; head and face French grey, passing on occiput and hind neck into the green of the back; chin and middle of upper throat maroon; throat and breast grey with a buff tinge; on middle of lower breast a broad patch of buff; sides of body greyish green, thighs greyer; flanks and lower abdomen and under tail-coverts cinnamon-rufous; under wing-coverts grass-green, the inner ones and quills below brownish slate; tail below brownish

[1]) The figure given by Reichenbach in "Novitiae", p. 203, t. 44 is not taken from *L. gularis* (Q. & G.).

slate, greyer at tip. "Iris light red; bill light gamboge-yellow; feet cherry-red" (♂, Malibagu in Gorontalo Distr., 22. XII. 93: P. & F. Sarasin).

Female. Does not seem to differ in coloration.

Measurements. Wing 167—183 mm (6 specimens); tail 145 ca.; tarsus 25 ca.; bill from feathers of forehead 17—18.

Distribution. Celebes: — Minahassa (Quoy & Gaimard *a I*, Forsten *2*, Wallace *d 1*, etc.); Gorontalo Distr. (Rosenb. *2*, Riedel, P. & F. Sarasin); Gulf of Tomini (Meyer *c 5*); Tonkean, E. Cel. (Nat. Coll. in Dresd. Mus.); West Celebes, Tawaya (Doherty *b 3*).

In July, 1828, the "Astrolabe" anchored at Manado, and the present species and others were then obtained and described by Quoy & Gaimard, the naturalists accompanying the expedition. The type is still in the Paris Museum *(3)*. This pigeon is not yet known from South Celebes, and it seems to be one of the rarer members of the *Columbae* in the North. After *P. subgularis*, its nearest known affinities are with *Ptilopus leclancheri* (Bp.) of the Philippines, which is smaller, has a broad maroon band across the lower breast, and the hind neck grey like the head. Bonaparte made a separate genus for the two, *Trerolaema* (C. R. 1855, XLI, 247). The attenuation of the first primary is as strongly pronounced in *P. gularis* as in *P. fischeri*, but the narrowed part varies much in length, viz. 18 mm to 27 mm. In his admirable Catalogue of the Pigeons Count Salvadori unites the present species with *P. fischeri*, *meridionalis* and others in the subgenus *Leucotreron*, a group found from the Malay Peninsula as far as the Timorlaut group, Celebes, and the Philippines, but not known in the Moluccas or Papuasia proper.

Among the birds of Celebes this species most closely resembles *Carpophaga radiata*, which may easily be recognised by its black bill, the grey band across the middle of its tail and its white chin and throat.

257. PTILOPUS SUBGULARIS M. & Wg.

Banggai Maroon-chinned Fruit-pigeon.

Ptilopus subgularis *(1)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 2, pp. 4, 6, 19.

"Bukun", Peling and Banggai, Nat. Coll.

Diagnosis. Like *P. gularis*, but the crissum and under tail-coverts dark chestnut-brown (instead of pale hazel), and the buff patch on the breast very weakly developed or almost obliterated (ad., Peling, V.—VIII. 1895: Nat. Coll. — C 14605, and others).

Younger. The occiput and hind neck grey-green (Banggai — C 14737).

Measurements. Wing 159—171 mm; tail c. 130; tarsus c. 25; exposed culmen c. 20.

Distribution. Peling and Banggai (Nat. Coll. in Dresd. and Tring Museums).

This Pigeon is a local race of *P. gularis* of Celebes. It is interesting to know that *P. gularis* occurs in East Celebes which is separated from Peling by a strait only about 20 kilometres, or a dozen English miles, wide. The characters given seem to be what are termed "constant". Up to the present no Pigeon

of the subgenus *Leucotreron* has been found in Sula, and it will be of interest in the future to know if *P. subgularis* conforms to what seems to be the general rule and presents no appreciable differences in that group of islands.

258. PTILOPUS MELANOCEPHALUS (Forst.).

Javan Black-capped Fruit-pigeon.

Plate XXXVIII.

a. **Columba melanocephala** *(I)* Forst., Zool. Ind. 1781, 16, pl. VII; *(II)* Temm. & Knip, Pig. 69, pl. 30 (1808—11).

b. **Ptilonopus melanocephalus** *(1)* Wall., P. Z. S. 1863, 486; *(2)* id., Ibis 1865, 381, pt.

Ptilopus melanocephalus *(1)* Schl., N. T. D. III, 1866, 207, pt.; *(2)* id., Mus. P.-B., Columbae, 1873, 28, pt.; *(3)* Elliot, P. Z. S. 1878, 551 (except Sula Besi); *(4)* Salvad., Cat. B. XXI, 1893, 142; *(5)* Hart., Nov. Zool. 1896, 179, 553, 563, 573, 575, 589, 597.

c. **Jotreron melanocephala** *(1)* Salvad., Ann. Mus. Civ. Gen. VII, 1875, 671.

d. **Ptilopus melanauchen** (Salvad.) *(1)* Büttik., Zool. Erg. Weber's Reise in Ost-Ind. 1893, III, 287.

For further synonymy and references cf. Salvadori *4.*

Figures and descriptions. Forst. *a I*; Temminck & Knip *a II*; Elliot *3*; Salvadori *4.*

Adult male. Parrot-green; head and neck whitish grey; occiput and back of neck black; chin and middle of throat pale lemon-yellow; under tail-coverts lake-red; the shorter ones and vent orange-yellow; quills and tail below dusky smoke-grey, the tip of the latter paler. "Edge of the eyelids light yellow; irides of three colours, an outer ring light yellow, a middle one dark grey, and the inner one light grey; bill green-yellow; feet vinous red" — Vorderman in Salvad. *4.* Wing 115 mm; tail 85 c.; tarsus 19; bill from feathers of forehead 14 (Java, v. Schierbrand, Nr. 13235).

Female. Parrot-green all over; but the longest under tail-coverts lake-red, as in the male.

Young. Like the female, but the under tail-coverts green.

Distribution. Java (Horsfield *4*, Reinwardt *2*, etc.); Bali (Doherty *5*); Lombok (Wallace *b 1*, *4*, etc. *5*); Sumbawa (Forsten *2*, Doherty *5*); Sumba (Riedel in Dresd. Mus., Doherty *5*); Satonda (Doherty *5*); Flores (Wallace *b 1*, *4*, Semmelink *2*); Djampea and Kalao (Everett *5*); Saleyer (Weber *d 1*, Everett *5*).

The Black-capped Green *Ptilopodes* form an extremely closely-connected set of local species, consisting of *P. melanocephalus* (Java to Flores and Saleyer), *P. bangueyensis* (Banguey, Basilan, Mindanao, Sooloo Islands), *P. melanospilus* (Celebes), *P. chrysorrhous* (Sula), *P. xanthorrhous* (Sangi Islands, Talaut). No fewer than four of the five forms therefore occur in the Celebes Subregion. The range of individual variation in many Pigeons is particularly small; the specific differences between these *Ptilopodes* are such as might be overlooked by a casual worker, nevertheless we have found it possible to assort specimens from Celebes, Sula, Sangi, Talaut, and Banguey correctly without examining the labels. The following key, which is based upon Count Salvadori's, should serve to distinguish them:

a. Smaller; wing 102—119 mm
a'. Gular spot pale lemon-yellow
a''. Gular spot narrow, occupying chin and middle of throat
melanocephalus (Forster).
b''. Gular spot broader, occupying some of the sides of the throat
bangueyensis Meyer.
b'. Gular spot darker
c''. Gular spot deep lemon-yellow, black occipital patch large, vent orange-yellow
melanospilus (Salvad.).
c'''. Occipital patch larger . . . . . *North Celebes race.*
d'''. Occipital patch smaller . . . . . *South Celebes race.*
d''. Gular patch orange, black occipital patch small, vent deep orange
chrysorrhous (Salvad.).
e''. Intermediate between the Celebes and Sula forms . *Banggai and Peling race.*
b. Larger; wing 118—139 mm
c'. Larger *race in Sangi* = *xanthorrhous* (Salvad.).
d'. Smaller *race in Talaut.*

Touching the occurrence of *P. melanocephalus* and not *melanospilus* in Saleyer, Mr. Büttikofer remarks that the two specimens, old males, collected by Prof. Weber do not display an orange-yellow, but a citron-yellow gular spot peculiar to the Leyden specimens from Flores and Sumbawa, and seen in one from West Java. More recently Mr. Hartert *(5)* has been able to confirm Mr. Büttikofer's determination in specimens from Kalao and Djampea, as well as Saleyer. The specific distinction of the Flores bird — *P. melanauchen* (Salvad.) — questioned by Mr. Büttikofer, is not upheld by Count Salvadori; Sumba examples *(2)* have a brighter green mantle than a Javan example.

* 259. PTILOPUS MELANOSPILUS (Salvad.).

Celebes Black-capped Fruit-pigeon.

a. **Ptilonopus melanocephalus** part. *(1)* Wall., P. Z. S. 1862, 344; *(2)* id., Ibis 1865, 381 (Cel.).
b. **Ptilopus melanocephalus** part. *(1)* Schl., Ned. Tdschr. Dierk. III, 1866, 207; *(2)* id., Mus. P.-B., Columbae, 1873, 29; *(3)* Guillem., P. Z. S. 1885, 269 (Cel.), 556; *(4)* Hickson, Nat. in N. Celebes 1889, 93.
c. **Iotreron melanocephala** part. *(1)* Wald., Tr. Z. S. VIII, 1872, 83; *(2)* Lenz, J. f. O. 1877, 377.
d. **Iotreron melanospila** *(1)* Salvad., Ann. Mus. Civ. Gen. VII, 1875, 670; *(2)* Meyer, Ibis 1879, 135, 146; *(3)* W. Blas., J. f. O. 1883, 114, 138; *(IV)* Meyer, Vogelskel. II, 1892, 50, t. CLXXV.
e. **Ptilinopus melanocephalus** var. **celebensis** *(1)* Brüggem., Abh. Ver. Bremen V, 1876, 80. **Ptilopus melanospilus** *(1)* Elliot, P. Z. S. 1878, 552; *(2)* W. Blas., Ztschr. ges. Orn. 1885, 303; *(3)* id., ib. 1886, 131; *(4)* Meyer, J. f. O. 1891, 70, 71; *(5)* Salvad., Cat. B. XXI, 1893, 144; *(6)* Büttik., Zool. Erg. Weber's Reise 1893, III, 281; *(7)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 15; *(8)* iid., ib. 1896, Nr. 1, p. 14; *(9)* iid., ib. 1896, Nr. 2, p. 19.
f. **Ptilinopus melanospilus** *(1)* Hart., Nov. Zool. 1897, 165.
"Pombo idiu kapala itam" (Green Dove with black head), Malay, Celebes, Meyer *d 2.*

"Burong wakian" (= Pigeon), Talissi, Hickson *b 4*.
"Wakian pongo", Malay, Minahassa, Nat. Coll.
"Ngul-ngul", near Manado, iid.
"Sebut ise ise", Tonkean and Balante, East Celebes, iid.
"Bukuru Roman", Tjamba Distr., Platen *2*.
For further synonymy and references cf. Salvadori *5*.
Figure and descriptions. Meyer *d IV* (skeleton); Schlegel *b 2*; Salvadori *d 1*, *5*; Brüggemann *e 1*.
Adult male. Like *P. melanocephalus* of Java, but the gular stripe deep lemon-yellow; tail below darker, the grey terminal band better defined. "Iris yellow; bill greenish yellow; feet cherry-red; claws grey" — Meyer *d 2* (near Manado, Aug.—Sept. 1892: Nat. Coll. — C 10903).
Female. Parrot-green; front of head and throat greyer; most of longer under tail-coverts lake-red (near Manado, Aug.—Sept. 1892; Nat. Coll. — C 10902).
Young male. Resembles the female; it next acquires first the orange crissum and red under tail-coverts, yellow throat and grey head, and lastly the black occipital patch (near Manado, Aug.—Sept. 1892: Nat. Coll. — C 10904 and 10900).

Measurements (adult males).

	Wing	Bill from feathers of forehd.
a. (C 13232) Kalibangkere, S. Cel. 3. IV. 78 (Platen)	116	13
b. (C 10905) near Manado, Aug.—Sept. 1892 (Nat. Coll.) . . .	116	14.8
c. (C 10897) near Manado, Aug.—Sept. 1892 (Nat. Coll.) . . .	115	13
d. (C 10899) near Manado, Aug.—Sept. 1892 (Nat. Coll.) . . .	118	13.5
e. (C 10903) near Manado, Aug.—Sept. 1892 (Nat. Coll.) . . .	117	—
f. (C 12295) Manado tua Id., April 1893 (Nat. Coll.)	119	12.5
g. (C 12294) Manado tua Id., April 1893 (Nat. Coll.)	119	—
h. (C 12291) Mantehage Id., April 1893 (Nat. Coll.).	110	14
i. (C 12293) Banka Id., May 1893 (Nat. Coll.)	118	—
j. (C 12293) Banka Id., May 1893 (Nat. Coll.)	114	—
k—n. 4 ad. ♂♂, East Celebes, V.—VIII. 95 (Nat. Coll.) . .	115–119	—

Skeleton (Meyer *d IV*).

Length of cranium . . .	45.0 mm	Length of tarso-metatarsus	21.0 mm
Greatest breadth of cranium	18.3 »	Length of digitus III . .	28.0 »
Length of humerus . . .	32.0 »	Length of sternum . . .	39.5 »
Length of ulna.	37.5 »	Greatest breadth of sternum	28.7 »
Length of radius	34.0 »	Height of crista sterni . .	15.5 »
Length of manus	38.7 »	Length of coracoideum . .	27.5 »
Length of metacarpus . .	19.6 »	Length of scapula . . .	32.8 »
Length of digitus principalis	18.0 »	Length of clavicula . . .	27.7 »
Length of femur	33.0 »	Length of pelvis	50.0 »
Length of tibia	43.0 »	Greatest breadth of pelvis .	30.0 »

Distribution. Celebes: — Minahassa (Forsten *b 2*, Wallace *5*, etc.); Talissi (Guillem. *b 3*, Hickson *b 4*); Banka, Lembeh, Mantehage, and Manado tua (Nat. Coll.); Gorontalo Distr. (Rosenb. *b 2*); Togian (Meyer *d 2*, *5*); East Celebes (Nat. Coll. in Dresd. and Tring Mus.); Kandari, S. E. Celebes (Beccari *d 1*); West Celebes (Doherty *f 1*); S. Celebes, Tjamba Distr. (Platen *2*), Tempe (Weber *6*).

While a very common species in North Celebes, this Pigeon appears to be rare in the South, where two specimens were obtained by Dr. Platen and

one by Prof. Weber. One of Platen's birds, mentioned by Prof. W. Blasius *(2)*, is now before us; it seems to have the occipital black patch somewhat smaller, and the lake-red under tail-coverts deeper in tint. Of Togian birds Meyer has remarked *(d 2)*: "My specimens from the Togian Islands (August) appear to differ a little, the head being rather violet than black". The Sangi race, *P. xanthorrhous*, is larger, has a larger bill and is of a shade darker green; it is interesting to find that specimens from Banka belong to Celebes, but those of Biarro, Tagulandang and Gunong Api to Sangi.

Meyer syllabifies the cry of this Pigeon as 'häu', hollow, and difficult to imitate. It generally flies in pairs and feeds on fruits.

260. PTILOPUS CHRYSORRHOUS (Salvad.).

Sula Black-capped Fruit-pigeon.

Plate XXXVIII.

a. **Ptilonopus melanocephalus** var. *(1)* Wall., P. Z. S. 1862, 335, 344.

b. **Ptilopus melanocephalus** part. *(1)* Schl., Ned. Tdschr. Dierk. III, 1866, 207; *(2)* id., Mus. P.-B., Col., 1873, 28, 29 (Sula); *(3)* Elliot, P. Z. S. 1878, 551 (Sula Besi).

c. **Jotreron chrysorrhoa** *(1)* Salvad., Ann. Mus. Civ. Gen. VII, 1875, 671.

d. **Ptilopus sulaensis** *(1)* Brügg., Abh. Ver. Bremen V, 1876, 81; *(2)* Salvad., Ibis 1876, 385.

Ptilopus chrysorrhous *(1)* Salvad., Ann. Mus. Civ. Gen. 1876, IX, 196, Nr. 9; *(2)* Elliot, P. Z. S. 1878, 553; *(3)* Salvad., ib. 1879, 63; *(4)* id., Orn. Pap. III, 1882, 51; *(5)* id., Cat. B. XXI, 1893, 144; *(6)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 2, p. 19.

For further synonymy cf. Salvadori *5*.

Descriptions. Wallace *a 1*; Salvadori *c 1, 4, 5*.

Adult male. Like *P. melanocephalus*, but the black occipital patch small, almost confined to the nape; gular stripe orange; vent and shorter under tail-coverts dark orange (cadmium-orange); tail below blackish, broadly tipped with grey; sides of lower hind neck yellowish green; under surface of body considerably darker green than the upper (♂, Sula Besi, from Boucard — C 10486).

Measurements. Wing 116—120 mm; tail 85 c.; tarsus 20 c.; bill from feathers of forehead 14.5—15 (Sula, 3 adult male examples); wing 109—114 mm (5 adult males, Peling and Banggai).

Distribution. Sula Islands: Sula Besi (Bernstein *b 2*, Hoedt *b 2*), "Sula Islands" (Allen *a 1, 5*); Peling and Banggai (Nat. Coll. in Dresd. and Tring Mus.); Ceram (Moens *b 1, b 2*, Wall. *b 1, b 2*).

Two individuals from Ceram are recorded by Schlegel, who states that they are absolutely identical with Sula birds. Most likely the species has strayed to Ceram in recent times. The differences of the Sula birds from those of Celebes and Java were first pointed out by Wallace, and afterwards confirmed by Schlegel and Salvadori. The last writer speaks of the gular stripe as like that of *P. melanospilus*, but we find it narrower and orange in colour, as against deep lemon-yellow. The Sula race is one of the best-marked of the group; on the whole it and the Javan form seem to mark the extreme variations

in colour of the group, to which Count Salvadori gave the subgeneric name *Spilotreron*. We have included the birds of Peling and Banggai with the Sula "species", but it would be preferable in many ways to represent them as *P. melanospilus — chrysorrhous*, as they occupy a somewhat intermediate position between the Sula and the Celebes birds. They run smaller in size than in Sula; the orange-yellow of the chin and throat is generally yellower, and often just as in Celebes birds, but the black occipital patch is about as small as in Sula birds.

* 261. PTILOPUS XANTHORRHOUS (Salvad.).

Sangi Black-capped Fruit-pigeon.

Plate XXXVIII.

a. **Ptilopus melanocephalus** part. *(1)* Schl., Ned. Tdschr. Dierk. III, 1866, 207; *(2)* id., Mus. P.-B., Col., 1873, 29.

b. **Iotreron xanthorrhoa** *(1)* Salvad., Ann. Mus. Civ. Gen. VII, 1875, 671; *(2)* W. Blas., J. f. O. 1883, 120, 160, 162.

c. **Ptilinopus nuchalis** *(1)* Brüggem., Abh. Ver. Bremen V, 1876, 80; *(2)* W. Blas., J. f. O. 1883, 160.

d. **Ionotreron xanthorrhoa** *(1)* Salvad., Ann. Mus. Civ. Gen. IX, 1876, 61.

Ptilopus xanthorrhous *(1)* Elliot, P. Z. S. 1878, 553; *(2)* W. Blas., Ornis 1888, 613, 642; *(3)* Meyer, J. f. O. 1891, 70, 71; *(4)* Salvad., Cat. B. XXI, 1893, 145; *(5)* M. & Wg., J. f. O. 1894, 238, 248; *(6)* iid., Abh. Mus. Dresd. 1895, Nr. 9, p. 7.

"Lendu", Great Sangi, Nat. Coll.

"Lengu", Siao, iid.

"Lenggu", Tagulandang, Ruang and Biarro, iid.

"Lungu" or **"Puney"**, Talaut, iid.

For further references cf. W. Blasius *2*; Salvadori *4*.

Adult male. Like *P. melanocephalus*, but larger; vent and shorter under tail-coverts deep orange; occipital black patch broader (Great Sangi, 20. VII. 93: Nat. Coll. — C 12660). "Iris yellow, feet cherry-red, bill yellow-green" (Platen *2*).

Adult female. Parrot-green, abdomen yellower, head and throat greyer; longest under tail-coverts lake-red, tipped with dark yellow (Great Sangi, 30. VII. 93: Nat. Coll. — C 12659). "Iris yellow-green; feet cherry-red, bill black" (Platen *2*).

Young. A specimen, similar to that described as an adult female, has the under tail-coverts entirely green, and is probably immature (Tagulandang, Aug. 1894: Nat. Coll. — C 13493). Prof. W. Blasius describes the female plumage as uniform green, but out of six examples from Gt. Sangi, Siao, Tagulandang and Ruang the above is the only one which wants red on the longest under tail-coverts.

Measurements (20 adult males from Gt. Sangi after Prof. W. Blasius *2*). Wing 130—140; tail 84—103; culmen 14.5—17.5 mm.

Specimens from Biarro, Ruang, Tagulandang and Siao are not intermediate between *P. melanospilus* and *P. xanthorrhous*, but agree with the latter, as the following measurements of adult males only show:

Measurements.	Wing	Bill from feather of forehead
a. (C 12661) Great Sangi, July 1893 (Nat. Coll.)	139	17
b. (C 12660) Great Sangi, July 1893 (Nat. Coll.)	134	15
b'. (Tring Mus.) Great Sangi, 13. Dec. 1894 (Nat. Coll.)	137	15.5
c. (C 12642) Siao, June 1893 (Nat. Coll.)	134	14
d. (C 13492) Tagulandang, Aug. 1894 (Nat. Coll.)	132	15
e. (Tring Mus.) Tagulandang, Aug. 1894 (Nat. Coll.)	136	15.5
f. (C 13495) Ruang, Aug. 1894 (Nat. Coll.)	132	16
g. (C 13496) Ruang, Aug. 1894 (Nat. Coll.)	131	15.5
h. (Tring Mus.) Ruang, Aug. 1894 (Nat. Coll.)	133	15.5
i. (Tring Mus.) Ruang, Aug. 1894 (Nat. Coll.)	130	16
j. (C 13498) Biarro, 2. Sept. 1894 (Nat. Coll.)	130	16
k. (C 13096) Salibabu, Talaut, Oct. 1893 (Nat. Coll.)	127	15
l. (C 13094) Kabruang, Talaut, Nov. 1893 (Nat. Coll.)	128	15
m. (C 13093) Kabruang, Talaut, Nov. 1893 (Nat. Coll.)	—	16
n. (C 13827) Karkellang, Talaut, Oct. 1894 (Nat. Coll.)	124	15
o. (C 13829) Karkellang, Talaut, Nov. 1894 (Nat. Coll.)	127	15
p. (C 13826) Karkellang, Talaut, Oct. 1894 (Nat. Coll.)	131	16
q. (C 13830) Karkellang, Talaut, Nov. 1894 (Nat. Coll.)	130	14.5
r. (C 15410) Karkellang, Talaut, autumn 1896 (Nat. Coll.)	124	16
s. (C 15409) Karkellang, Talaut, autumn 1896 (Nat. Coll.)	128	15.5

Distribution. Sangi Islands: — Great Sangi (v. Rosenb. *a 2*, Hoedt *a 2*, Bruijn *b 1*, Platen 2, Nat. Coll.); Siao (Hoedt *a 2*, v. Duivenb. *a 2*, Meyer, Nat. Coll.); Tagulandang, Ruang and Biarro (Nat. Coll. in Dresd. and Tring Mus.); Talaut Islands (Nat. Coll.).

The Sangi race follows the rule for Sangi in being larger than its fellow-species, *P. melanospilus*, of Celebes; it is further distinguishable by its paler yellow gular stripe and slightly darker green plumage; the female likewise has the plumage slightly darker green. Under the name *P. nuchalis* Brüggemann described 11 specimens from Fischer and one from Riedel, all said to be from Celebes, and Prof. W. Blasius found them to be identical with *P. xanthorrhous*. It is quite incredible that *P. xanthorrhous* and *melanospilus* could exist together in the same locality and yet keep distinct; their slight differences have certainly arisen under separation, and we cannot doubt that the birds would interbreed freely and lose them if they met. As in several other cases Brüggemann was led by false labels or other causes to record Sangi species from the mainland of Celebes, so in this case also some confusion of the kind must have taken place.

It is interesting to find that the birds on Biarro and Tagulandang are not intermediate between the Sangi and the Celebes species, but belong to the former; showing that the birds are extremely stationary and that these intermediate islands must afford the same conditions, whatever they may be, as Great Sangi. The specimens from Great Sangi appear to differ in the green shade from specimens of the southern islands.

In the last few years large numbers from the Talaut Islands have reached the Dresden Museum and have been closely examined. All that can be said

for them is that they are on an average slightly smaller than those of the Sangi Islands.

262. PTILOPUS TEMMINCKI (Des Murs & Prév.).

Painted Pigeon.

a. **Columba superba,** fem. *(1)* Prév. & Knip, Pig. II, 1838—43, pl. 42.

b. **Kurukuru temminckii** *(1)* Des Murs & Prév., Voy. Vénus, Zool. 1846—55, 236, 268.

c. **Ptilonopus formosus** *(1)* Gray, P. Z. S. 1860, 360; *(2)* Wall., Ibis 1865, 379.

d. **Ptilopus formosus** *(1)* Schl., Ibis 1863, 120; *(2)* Guillem., P. Z. S. 1885, 248, 269 (Sulu), 556; *(3)* Sharpe, Ibis 1894, 257 (Sulu).

e. **Ptilonopus superba** pt. *(1)* Finsch, Neu-Guinea 1865, 176.

f. **Ptilopus superbus** pt. *(1)* Schl., Ned. Tdschr. Dierk. 1866, III, 209; *(2)* id., Mus. P.-B., Columbae, 1873, 30, 32 (Cel.); *(3)* Rosenb., Malay. Archip. 1878, 275.

g. **Ptilonopus celebensis** *(1)* Wallace, Malay Archip. 1869, I, 366 (German ed. by A. B. Meyer, I, 332).

h. **Ptilonopus formosus** *(1)* Gray, HL. II, 1870, 227, Nr. 9159; *(2)* Brügg., Abh. Ver. Bremen 1876, V, 79.

i. **Lamprotreron formosa** *(1)* Wald., Tr. Z. S. 1872, VIII, 82; *(2)* Meyer, Ibis 1879, 135.

Ptilopus temmincki *(1)* Elliot, P. Z. S. 1878, 544; *(2)* Salvad., ib. 1879, 62; *(2bis)* id., Orn. Pap. II, 1881, 11, 12; *(III)* W. Blas., Z. ges. Orn. 1885, 302, pl. XIV; *(4)* Salvad., Cat. B. XXI, 1893, 115; *(5)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 15; *(6)* Hart., Nov. Zool. 1896, 163.

"Ngul-ngul werreng", near Manado, Nat. Coll.

"Wakian kapala mera", Malay, Minahassa, iid., (**"Wakian pongot"**, given by Guillemard *d 2* as the name of this pigeon, is that of *P. melanospilus*).

For further references cf. Salvadori *4*.

Figures and descriptions. Knip *a I* (♀); W. Blasius *III* (♂ ad. et juv.); Wallace *c 2*; Brüggem. *h 2*; Elliot *1*; Salvadori *4*)

Adult male. General colour above parrot-green, the inner wing-coverts, scapulars and inner quills with an oval black spot near the ends; entire head above aster-purple; hind-neck and sides of neck dragon's-blood-red, shading off into the green of the mantle; sides of occiput and ear-coverts green, becoming grey on malar region, chin, throat and jugulum; the upper breast rose-purple, the feathers on chest and jugulum forked at the tip (as if the middle part of the web had been cut out with scissors); passing on lower breast into a broad band of blackish plum-purple; on and near the carpal edge a large spot of this colour; sides, thighs and flanks green, thighs greyer, flanks tipped with Naples-yellow; abdomen and under tail-coverts yellowish white, the inner webs of the latter partly green; centre tail-feathers above green, greyish at tip, all the lateral tail-feathers blackish, tipped with grey, washed with green; tail below dusky greyish, terminal bar whitish; quills above black, washed externally with green, finely edged with yellowish; wings below slaty, the first primary much attenuated for 2 cm ca. and incurved. "Iris yellow; bill black (♀?) or green or yellow-green (♂); feet coral-red" (Meyer *i 2*, Guillem. *d 2*, Platen *III*), (near Manado, Aug.—Sept. 1892: Nat. Coll. — C 10891).

Adult female. Above all parrot-green, except for a patch of aster-purple on crown and occiput, and purplish black spots on the scapulars and inner coverts; breast green, without the rose-purple and the dark plum-purple band of the male ([♀] near Manado, Aug.—Sept. 1892, Nat. Coll. — C 10892).

Immature male. Closely resembling the female; forehead green with the purple feathers of the crown intermingled; dark purple breast-band commencing to form; breast greyer than in female ([♂] near Manado, Aug.—Sept. 1892: Nat. Coll. — C 10890).

Young in first plumage. Bright parrot-green, the wing-coverts and secondaries broadly margined with light yellow, the back, rump and scapulars and breast more finely margined with yellow; remaining under-parts much as in the female; tail tipped with yellowish white; no purple on head or elsewhere (near Manado, Aug.—Sept. 1892: Nat. Coll. — C 10895).

Measurements. Wing 128—140 mm; tail 95c.; tarsus 22c.; culmen from cranium suture 17—19.

Distribution. Celebes and ? Sooloo: North Celebes — Minahassa (Wall. *c 2*, *4*, Ros. *f 2*, etc.); South Celebes — Maros River (Wallace *g 1*), Tjamba Distr. (Platen *III*), Bonthain Mts. (Everett *6*); Sooloo Islands (Guillem *d 2*).

This many-hued Pigeon is a common bird in parts of the Minahassa, where our native hunters collected nearly 50 examples in August and September, 1892, between Manado and Arakan, and 6 near Tondano. It seems to be absent on the islands off the coast, such as Manado tua and Togian; nor has it been recorded from any part of Celebes itself except the Northern and Southern Peninsulas. In the stomach Meyer found the waringin, a species of fig.

P. temmincki is most like *P. superbus* (Temm.) of the Moluccas, Papuasia and North Australia, the male of which may best be distinguished by its having the dark plum-purple lower breast-band sharply marked off from the dark lavender-grey of the breast, while in *P. temmincki* the breast is rose-purple and gradually merges into the intense plum-purple band. The females are as easily distinguishable, that of *P. superbus* by a small occipital spot of dark blue, that of *P. temmincki* by a much more extensive spot of aster-purple. Together the two species form the subgenus *Lamprotreron*.

Perhaps the most remarkable point in connection with the plumage of this bird is the broad dark purple patch on the carpal region, which in the living bird is no doubt continuous with the breast band of the same colour. This produces a wide band embracing parts of the body which have nothing to do with one another — the wings and the breast. Mr. Keeler accounts for similar markings by the theory of sexual selection — a process not occurring in nature, as females never select males; but it appears that the colour of a spot affects the area around it. The quills and greater coverts of the Cuckoo, *Phoenicophaes calorhynchus*, are steel-blue-black, the other coverts and scapulars are chestnut, yet where the edges of the greater coverts and quills come in contact with the other feathers they are chestnut, and some of the concealed parts of the greater coverts are suffused with that colour. So, also, in very many birds the under wing-coverts (a hidden character) partake of the colour of the sides of the body, with which they come in contact.

The first primary of the present Pigeon is remarkably attenuated, as in many other Pigeons, at the tip, and the position of the first primary under the wing in these Pigeons, and the peculiar flight of these birds brings conviction that mechanical attrition should be assigned as the cause of the attenuation, as

has been observed already (pp. 252, 603); and in the same way the diffusion of a colour on to the parts which are placed in contact with it may be indirectly due to the mechanical action of light, on the same principle as the colours of pupae, which vary according to the colours of the papers upon which they are placed. (See, also, *Graucalus bicolor*, *Lalage leucopygialis*, *Calidris arenaria*, *Limosa melanura*, *Hierococcyx crassirostris*, *Glareola*).

Dr. Guillemard suggests some differences in the Sooloo race — larger size, the feathers of the breast less bifid; we are not acquainted with this form.

GENUS CARPOPHAGA Selby.

These Fruit-pigeons range in size from that of a Rock-dove upwards; the most usual colours are metallic green on the upper surface, grey on the head, neck, and crop, and grey or rufous below, though slaty, purple, and white also occur. The tarsus is feathered for about half its length, being less than in *Ptilopus*. Wing of variable length, generally rather long; tail of 14 rectrices, shorter than the wing, square — except in *C. (Cryptophaps) poecilorrhoa* in which it is strongly rounded. The genus ranges from India to Papuasia and the Fiji Islands, but not Australia, and Count Salvadori divides it into 6 subgenera (see, below, p. 626).

263. CARPOPHAGA CONCINNA Wall.

Insular Imperial Pigeon.

Plate XXXIX.

Carpophaga concinna *(1)* Wall., Ibis 1865, 383, 398; *(2)* id., J. f. O. 1866, 280; *(3)* Schl., Mus. P.-B., Col., 1873, 82; *(4)* Brüggem., Abh. Ver. Bremen V, 1876, 84; *(5)* Salvad., Ann. Mus. Civ. Gen. IX, 1876, 62, 65, 200; *(6)* id., P. Z. S. 1878, 85, 89; *(7)* Meyer, Verh. z.-b. Ges. Wien 1881, 772; *(8)* Salvad., Orn. Pap. III, 1882, 81; *(9)* Sclat., P. Z. S. 1883, 51, 195, 200; *(10)* Forbes, ib. 1884, 433; *(11)* Meyer, Isis, Dresden 1884, 6, 51; *(12)* Büttik., Notes Leyden Mus. 1886, VIII, 66; *(13)* W. Blas., Ornis 1888, 615, 642; *(14)* Hartert, J. f. O. 1891, 301; *(15)* Salvad., Agg. Orn. Pap. 1891, 181; *(16)* id., Cat. B. XXI, 1893, 186; *(17)* Sharpe, Ann. & Mag. N. H. 1894 LXXIX, 58; *(18)* M. & Wg., J. f. O. 1894, 249, 250; *(19)* iid., Abh. Mus. Dresd. 1895, Nr. 9, p. 7; *(20)* Hart., Nov. Zool. 1896, 179.

a. **Carpophaga roseinucha,** part. *(1)* Schl., Ned. Tdschr. Dierk. 1866, III, 197, 344.

b. **Carpophaga paulina** *(1)* Hickson (nec Bp.), Nat. in N. Celebes 1889, 41.

c. **? Carpophaga aenea,** part. *(1)* Hartert, Kat. Vog. Slg. Senckenb. Mus. 1891, 189.

"Arana", Kabruang, Talaut, Nat. Coll.

"Aheng", Great Sangi, Siao, Tagulandang, Ruang and Biarro, iid.

For further synonymy and references cf. Salvad. *16*.

Descriptions. Wallace *1*; Salvadori *8*, *16*; M. & Wg. *18*.

Adult. Head, neck, mantle and under-parts pearl-grey, darker on the flanks, whitish on chin, a slight vinous tinge on nape and hind neck; frontal edge whitish; under tail-coverts chestnut; back, wing-coverts, and rump dark metallic golden-green, here

and there with blue reflections; quills and tail above glossy blackish blue, the inner quills and the edges of the upper tail-coverts washed with the green of the back; wing below blackish brown, under wing-coverts mostly dark metallic green, axillaries slaty; tail below blackish. "Iris orange-yellow (or orange), bill black, feet cherry-red" — Platen *13* (Ruang, August, 1894: Nat. Coll. — C 13481).

Female. Three females (Gt. Sangi) examined by Prof. W. Blasius *(13)* displayed fewer blue reflections on the upper surface than three males; Dr. Brüggemann, on the other hand, speaks of a female with dark steel-blue borders. We suspect that the more uniform metallic green of the upper surface is a sign of age, and, following a well-known rule, that it is acquired more slowly by the female than the male.

Nestling. (Wing 156 mm.) Already coloured just like the adult female (Brüggem. *4*).

Measurements. Wing (12 adults: Sangi Islands) 273—295 mm, wing (4 adults: Kabruang) 265—280; tail 170 ca.; tarsus 36 ca.; bill from feathers of forehead 19—21.

Distribution. Tenimber Islands or Timorlaut-group — Larat and Maru (H. O. Forbes *9*), Cera or Seyrah, Tenimber or Vordate (Riedel *7*); Babbar (Riedel *7*); Dammar (Riedel *11*, Walker *17*); „one small island west of Aru" (Wallace *1*, *16*); Lutor and Pulo-babi (Beccari *8*); Aru group (Rosenberg and Hoedt *3*); Kei Islands (Rosenb. *3*, Hoedt *3*, Beccari *8*, "Challenger" Exp. *16*); Tejoor (Rosenb. *3*); Matabello or Watubella (Wallace *1*, *3*, *16*); Goram group — Manawolka and Padjang (Rosenb. *3*, *8*); Goram (Rosenb. *3*, D'Alb. *8*); Banda (Reinwardt fide Salvad. *8*, Wallace *1*, Hoedt *3*); Batang kitjil near Tifore (Bruijn *5*); Sangi Islands — Great Sangi (Rosenb. *3*, Meyer, Fischer *4*, Platen *13*, Nat. Coll.), Siao (Hoedt and v. Duivenbode *3*, Nat. Coll.); Biarro, Ruang, and Tagulandang (iid.); Talaut — Kabruang and Karkellang (iid. *18*).

This large Pigeon seems to be of insular or oceanic habits, in the sense that it is met with only on small islands, around the largest of which it could fly in about an hour. It is now known to occur from Talaut to Aru and Tenimber, yet it is wanting in the large intermediate islands of Halmahera, New Guinea, Ceram, Buru, Celebes, etc.; and between the Sangi group and Banda, where a break in its distribution occurs, it has as yet been discovered only on the islet of Batang kitjil near Tifore in the Molucca Straits. On the islands of Ruang and Tagulandang between Sangi and the Minahassa it seems to be a plentiful species; it is evidently this Pigeon which Dr. Hickson saw on Ruang in great numbers, and not *C. paulina (b 1)* of the mainland of Celebes; the latter was not obtained in these islands by our native hunters, and *C. concinna* has never been heard of on the mainland. *C. paulina* is easily distinguishable by its much smaller size and orange-tawny hind neck. More similar is *Carpophaga geelvinkiana* Schl. of the islands of Geelvink Bay, N. Guinea, which has a white forehead with the feathers abruptly cut off about 6 mm above the nostrils instead of encroaching to above their base, and *C. intermedia* M. & Wg. of Talaut with a uniform dark bronze-green back, chocolate-brown under tail-coverts, no white frontal edge, etc. *C. concinna* varies in itself to some extent as regards size; Count Salvadori says Kei Islands birds are the largest of all. Sangi specimens are large.

Mr. Hartert *(20)* has fixed a trinomial on to the Kei Islands birds,

remarking that he does not find that they differ in size, but that "the entire under surface is not light grey, but creamy white with only a slight cinereous tinge".

It would be well to know whether *C. concinna* is really a stationary species, or like *Myristicivora bicolor* a seasonal wanderer among these islands, whether its colours brighten in the breeding season, or whether it differs on every island, etc., before commencing to "split" it into subspecies.

Fruits and seeds were found in the stomachs of specimens obtained by hte "Challenger" Expedition at Kei. Wallace remarks that it has "a remarkably loud, hoarse, booming note, like the roar of a wild beast".

* 264. CARPOPHAGA PAULINA (Bp.).

Celebes Imperial Pigeon.

a. **Columba aenea**, ♀ *(1)* Temm. & Knip, Pig. pl. 4 (1808—11).

b. **Ducula paulina** *(1)* Bp., Consp. II, 1854, 35 (ex Temm. MS.); *(2)* id., Compt. Rend. XXXIX, 1854, 1076; XL, 1855, 217, Nr. 94; *(3)* id., Coup d'Oeil Ordre Pig. 1855, 16, 55; *(IV)* Rchb., Tauben I, 1862, 115, 199, t. 230 b., fig. 3360, Novitiae, t. VI, fig. 69.

c. **Carpophaga rufinuchalis** *(1)* Cass., Pr. Ac. Nat. Sc. Philad. 1854, 228.

Carpophaga paulina *(1)* Bp., Compt. Rend. XLI, 1855, 247; *(2)* Wall., P. Z. S. 1862, 335, 345 (Sula); *(3)* id., Ibis 1865, 385, 398; *(4)* Schl., Ned. Tdschr. Dierk. III, 1866, 200; *(5)* Wald., Tr. Z. S. VIII, 1872, 83; *(6)* Schl., Mus. P.-B., Columbae, 1873 84; *(7)* Wald., Tr. Z. S. IX, 1875, 215; *(8)* Meyer, Ibis 1879, 125, 146; *(8bis)* Legge, B. Ceylon 1880, 719; *(9)* Cab., J. f. O. 1882, 125; *(10)* Guillem., P. Z. S. 1885, 557; *(11)* W. Blas., Z. ges. Orn. 1885, 306; *(11bis)* Guillem., Cruise "Marchesa" 1886, II, 186; *(12)* Hickson, Nat. in N. Celebes 1889, 93; *(13)* Salvad., Cat. B. XXI, 1893, 189; *(14)* P. & F. Sarasin, Z. Erdk. Berlin 1894, 382; *(15)* Grant, Ibis 1895, 116; *(16)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 15; *(17)* iid., ib. 1896 Nr. 1, p. 14; *(18)* iid., ib. 1896, Nr. 2, p. 20; *(19)* Hart., Nov. Zool. 1897, 160, 165.

d. **Carpophaga paulinae** *(1)* Brüggem., Abh. Ver. Bremen 1876, V, 84; *(2)* Pelz, Verh. z.-b. Ges. Wien 1876, 719.

"Kum-kum idiu" (Green Carpophaga), Malay name, Minahassa, Meyer *8*; Nat. Coll.

"Kur-kur", near Manado, Nat. Coll.

"Kua-kua", Tjamba Distr., S. Celebes, Platen *11*.

"Kuha", Tonkean, E. Celebes, Nat. Coll.

"Tokulok", Balante, E. Celebes, Nat. Coll.

For further references cf. Salvadori *13*.

Figures and descriptions. Knip *a I*; Reichenbach *b IV*; Schlegel *4*; Salvadori *13*.

Adult male. Head above, throat and under-parts grey, darkest on occiput and sides of neck, washed with purplish on crown, throat and jugulum, with vinaceous on breast and abdomen, with rose on sides of head and middle of abdomen; under tail-coverts chestnut; forehead, in front of eyes, and chin white, passing into grey; hind neck orange-cinnamon-rufous; ear-coverts washed with this colour; above the mantle dark brown-grey; entire back, upper tail-coverts and upper wing-coverts metallic golden-green; quills above mealy blackish myrtle-green, the inner ones washed with golden-green; quills below broccoli-brown; under wing-coverts dark grey; tail above dark bluish green; below broccoli-brown. "Bill lead-blue,

above nostrils to base red, iris deep red; eyelids red" — Wallace *3* (♂, Kema, 26. X. 93: P. & F. Sarasin). Wing 231 mm; tail 140, tarsus 31; culmen from cranial suture 31.

Female. Just like the male (♀, Tjamba Distr. 4. VI. 78: Platen — C 13230).

Young? Two examples moulting show many blue-tipped feathers (old feathers!) among the uniform golden-green ones (new feathers) of the upper surface; either the young shows strong blue reflections, or the feathers lose much of their golden-green hue and become blue through wear (Manado tua, April, 93: Nat. Coll. — C 12128; Mantehage, April, 1893: Nat. Coll. — C 12125).

Measurements. 13 examples from the Northern Peninsula and the islands off the coast have wing 218—231 mm; Peling and Banggai (5) wing 226—244 mm; Southern Peninsula (2 examples) wing 234—239[1]); East Celebes (4) wing 220—245.

Variation. The Southern birds differ as follows from the Northern: size slightly larger, back a little more burnished brassy, tail above generally greener.

Mr. Hartert *(19)* speaks of a specimen or specimens from Macassar as being "exactly like specimens from North Celebes". In the Minahassa and the islands off the coast the tint of the upper surface varies from reddish coppery to coppery green. A few specimens have patches of myrtle-green above, best seen in two or three examples from the islands of Manado tua and Mantehage; these are probably younger birds, the perfectly uniform ones older.

East Celebes. None of the examples sent to the Dresden Museum from here showed myrtle-green patches above, all being uniform, and reddish or greenish coppery as in the Northern birds.

Peling and Banggai. The specimens from these islands are also uniform and show the same tints as the East Celebes birds. Like the latter they are somewhat large in size.

Egg. "The only egg obtained by Platen is from Rurukan in the Minahassa; it measures 43 × 38 mm and is very glossy white" (Nehrkorn MS.).

Distribution. Celebes and Sula: — Talissi (Guillemard *10*, Hickson *12*), Lembeh, Banka, Manado tua and Mantehage (Nat. Coll.); Minahassa (Forsten *6*, Wallace *3*, etc.); Gorontalo Distr. (v. Rosenb. *6*, Riedel *11*); West Celebes (Doherty *19*); Central Celebes, Lake Posso (P. & F. Sarasin *17*), East Celebes (Nat. Coll. Dresd. and Tring Mus.); Peling and Banggai (ib.); Macassar (Wallace *3*, *13*); Tjamba Distr. (Platen *11*); Sula Mangoli (Bernstein and Hoedt *6*); "Sula Islands" (Allen *2*, *13*).

Meyer speaks of *Carpophaga paulina* as very common everywhere in Celebes, living in flocks, generally on waringin trees. It feeds on fruits. Dr. Guillemard states that the under mandible in Pigeons of this genus is capable of enormous extension; they can swallow fruits nearly as large as a small orange. Mr. Wallace and Prof. Schlegel identify the Sulan birds with those of Celebes, and Count Salvadori does not mention any differences. The Sulan race is said by Schlegel *(4)* to be considerably smaller with the bright orange-cinnamon of the nape not carried so far down on the hind neck, and the bronze-green of the upper parts inclining more strongly to coppery red. Schlegel identified a specimen from Luzon with it, as Hartert seems to have done later

[1]) These two specimens were measured by Prof. W. Blasius, who records their wings as only 224 and 228 mm, respectively; but he seems to have measured under the wing with a straight rule, whereas we always measure over it.

with one from Mindoro (Kat. Senckenb. Mus. 1891, 189; J. f. O. 1891, 301); but these are most likely *C. nuchalis* Cab., a species described as differing by its smaller and much darker nuchal patch, and the grey of the neck a very little washed with rose. Grant *(15)*, however, says that specimens of that species from N. E. Luzon are larger; the nuchal patch is much smaller, and "deep maroon instead of chestnut". Walden separated the Togian bird on account of its being "copper-coloured instead of green" above, and smaller; like Salvadori we doubt the distinctness of this race, called *C. pulchella*. As already pointed out South Celebes birds differ a little from those of the North.

* 265. CARPOPHAGA PULCHELLA Tweedd.

Togian Imperial Pigeon.

Carpophaga pulchella *(1)* Wald., Ann. & Mag. N. H. 1874, (4) XIV, 157; *(2)* Brüggem., Abh. Ver. Bremen 1876, V, 84; *(3)* Meyer, Ibis 1879, 135, 146; *(4)* id., Ibis 1892, 180; *(5)* Salvad., Cat. B. XXI, 1893, 189.

For further references cf. Salvad. *5*.

Description. Walden *1*.

Adult male. Differs from *C. paulina* by being copper-coloured instead of green; its dimensions are also less. Wing 216 mm; tail 140; tarsus 25; bill fr. forehead 32 (Wald *1*).

Distribution. Togian (Meyer *1*, *3*).

We share Brüggemann's and Salvadori's doubt as to the specific validity of this bird; some examples of *C. paulina* from the Minahassa are more coppery green than others, the colour being, perhaps, acquired with age.

* 266. CARPOPHAGA INTERMEDIA M. & Wg.

Talaut Imperial Pigeon.

Plate XXXIX.

Carpophaga intermedia *(1)* M. & Wg., J. f. O. 1894, 238, 249, 250; *(2)* iid., Abh. u. Ber. Mus. Dresd. 1895, Nr. 9, p. 7.

"Arana" (as also *C. concinna*), Kabruang, Nat. Coll.

Description. M. & Wg. *1*.

Adult. Like *C. concinna*, but the lower breast and abdomen deep vinaceous-buff, not light grey; the under tail-coverts dark chocolate-brown, not chestnut; under wing-coverts dark grey, without any green; feathers of frontal edge divided by the culmen into two points, grey like the head, not white; an extensive area on hind neck pale vinaceous; tail above mealy myrtle-green, not dark blue; back dark bronze-green, instead of golden-green; feet dusky with a red hue, not cherry-red. Wing 263—271 mm (7 examples); tail c. 160; tarsus c. 28; bill from first feathers of forehead c. 20 (Kabruang, 6. XI. 93: type — C 13107).

Remark. Similar to *C. aenea* (L.), but the light grey of the hind neck and upper mantle contrasting sharply with the bronze-green of the back (which is metallic golden-green against a dark grey neck in *C. aenea*); tail below black or nearly black, not broccoli-brown; size larger.

Distribution. Talaut — Kabruang and Karkellang (Nat. Coll.).

The type of this species was sent from Talaut among a number of specimens of *C. concinna*. We at first described it as intermediate between *C. concinna* and *geelvinkiana*, but we now consider that its affinities are more with *C. aenea*, which ranges from India to the Philippines, Borneo and Flores, varying somewhat locally (cf. Salvad., Cat. B. 1893, XXI, 193). With this species it agrees in the feathering of the base of the bill, but differs in the points described, which make it too distinct a bird to allow it to be viewed simply as a local race.

267. CARPOPHAGA ROSACEA (Temm.).

Vinous-headed Imperial Pigeon.

a. **Columba rosacea** *(I)* Temm., Pl. Col. 578 (1835); *(II)* Prév. & Knip, Pigeons II, 1838—43, pl. 34.

Carpophaga rosacea *(1)* Gray, List Gallinae Brit. Mus. 1844, 6; *(2)* Wallace, P. Z. S. 1863, 486; *(3)* id., Ibis 1865, 386, 398; *(4)* Schl., Ned. Tdschr. Dierk. III, 1866, 201, 344; *(5)* id., Mus. P.-B., Columbae, 1873, 87; *(6)* Salvad., Orn. Pap. III, 1882, 89; *(7)* Sclat., P. Z. S. 1883, 51, 195, 200; *(8)* H. O. Forbes, P. Z. S. 1884, 433; *(9)* Meyer, Z. ges. Orn. 1884, 194; *(10)* Salvad., Cat. B. XXI, 1893, 198; *(11)* Sharpe, Ann. & Mag. N. H. 1894, LXXIX, 58; *(12)* Hart., Nov. Zool. 1896, 179, 574, 576.

b. **Ducula rosacea** *(1)* Bp., Consp. II, 1854, 36; *(II)* Rchb., Tauben 1862, 115, t. 228, f. 1275; *(3)* Wald., Tr. Z. S. 1872, VIII, 84; *(4)* Meyer, Ibis 1879, 136; *(5)* Vorderman, N. T. Ned. Ind. 1893, LII, 202.

For further synonymy and references cf. Salvadori *10*.

Figures and descriptions. Temminck *a I*; Knip *a II*; Reichenbach *b II*; Salvad. *6*, *10*; Vorderman *b 5*.

Adult. "Head pale vinous, whitish on the frontal edge; neck pale grey; back greyish bronze-green; longer upper tail-coverts brighter metallic green; breast and abdomen pale vinous like the head; under tail-coverts chestnut; quills underneath dark grey; under wing-coverts grey; tail above dull metallic green, below greyish brown: bill lead-colour, red at base above; iris and eyelids red, orbits bare, pale lead-colour; feet pink-red — Wallace *3*. Wing 235—240 mm, tail 155—165, bill 18—19, tarsus 26—27" (Salvad. *6*, *10*).

Female. Like the male (Salvad. *10*).

Distribution. Kangean (Vorderman *b 5*); Satonda near Sumbawa (Doherty *12*); Flores (Wallace *2*, *3*, *10*, Semmelink *5*); Timor (S. Müller *5*, Wallace *2*, *3*, *10*); Wetter, Kisser, and Letti (Hoedt *5*); Dammar (Bussett-Smith *10*, Walker *11*); Tenimber Islands — Maru and Lutu (H. O. Forbes *7*); Kei Islands (Hoedt *5*, v. Rosenb. *5*, Beccari *6*); Halmahera (Bernstein *5*); Djampea (Everett *12*); Celebes — Kakas, North Peninsula (Meyer *b 4*); Macassar (Wallace *3*, *10*).

A Pigeon shot by Meyer at Kakas in June, 1871, was identified by him with this species. It had previously been found at Macassar by Wallace, from whom there are two specimens thence in the British Museum. As already mentioned, birds from the Timor group, if occurring in Celebes, are always found in the South of the island, but not always in the North; the explanation being, as we believe, that they have not yet had time to spread their range across the

800 miles of very mountainous country to the North. The present species must be a very rare bird in the North.

Count Salvadori places it next to *C. pistrinaria* Bp. of the Solomon Islands and *C. vanwycki* Cass. of the New Britain group, which may be distinguished by their having the head above grey. *C. aenea* may be recognised from it by its bright bronze-green back; *C. paulina* by the same character and further by its orange-cinnamon nape; *C. pickeringi*, which occurs in Talaut, by its grey under tail-coverts and mealy bottle-green back and wings.

268. CARPOPHAGA PICKERINGI Cass.

Sooloo-Sea Imperial Pigeon.

a. **Carpophaga aenea** *(1)* Peale (nec Linn.), U. S. Expl. Exp., Zool. 1848, 198.

Carpophaga pickeringi *(1)* Cass., Pr. Ac. Sc. Philad. VII, 1854, 228; *(II)* id., U. S. Expl. Exp. 2nd ed. 1858, 267, pl. XXVII; *(III)* Rchb., Tauben 1862, 184, Novitiae t. VI, f. 72; *(4)* Sharpe, Tr. L. S. 1877, (2) I, 311, 353; *(5)* Guillem., P. Z. S. 1885, 270, 418, 420; *(6)* id., Cruise "Marchesa" 1886, 13; *(7)* Everett, Ibis 1888, 282; *(8)* W. Blas., J. f. O. 1890, 137; *(9)* Salvad., Cat. B. XXI, 1893, 201; *(10)* Sharpe, Ibis 1894, 241, 257; *(11)* M. & Wg., J. f. O. 1894, 238, 248.

b. **Carpophaga everetti** *(1)* Grant, Ann. & Mag. N. H. 1888, (6) II, 351.

"Arana adioa", Talaut, Nat. Coll.

For further synonymy and references cf. Salvadori *9.*

Figures and descriptions. Cassin *II*; Reichenbach *III*; Salvadori *9.*

Adult. Head, neck, under-parts and under wing- and tail-coverts grey, washed with rose-pink on head, breast and abdomen, under tail-coverts browner; frontal edge, a ring round the eyes, loral and malar region, chin and upper throat whitish, passing into grey; back, wings and tail mealy bottle-green, the inner quills, longer tail-coverts and middle tail-feathers above more metallic; quills and tail below broccoli-brown, the shafts below whitish (above black): "Iris dull red; space round eye red; bill bluish green; feet and tarsus dull purplish red" — Guillem. *5* (Kabruang, Nov. 1893: Nat. Coll. — C 13104).

Sexes. The sexes are similar (Guillem. *5*, Salvad. *9*).

Measurements (3, Kabruang). Wing 230—235 mm; tail c. 140—155; tarsus c. 32; bill from first feathers of forehead i. e. behind nostril 19—21.5.

Distribution. Mantanani Islands off N. Borneo (Everett *7, 9*); Mangsi Island in Balabac Strait (Peale *a 1, 5*); Cagayan Sooloo (Guillem. *5*); Sooloo Islands — Sooloo (Guillem. *5*); Sibutu — "seen only" (Everett *10*); Talaut Islands — Kabruang (Nat. Coll.).

Five specimens — three in the Dresden, two in the Tring Museum — of this Pigeon were killed by our native hunters in November, 1893, on the island of Kabruang, Talaut. Compared with an example from Cagayan Sooloo, kindly lent to us by the Hon. Walter Rothschild, the Talaut birds display generally darker tints, slightly darker grey on nape, mantle and under wing-coverts, darker bottle-green on back, wings and tail, and somewhat darker under surface, but apparently somewhat more white on throat. These differences may be racial, or seasonal, or individual.

This species may be distinguished at once from the allied Fruit-pigeons of the Celebesian subregion by its grey, not chestnut, under tail-coverts. Count Salvadori places it next to *C. cineracea* (Temm.) of Timor, which has a dark ashy brown back and ochreous abdomen and under tail-coverts. Like *C. concinna*, *C. pickeringi* seems to be of insular or oceanic habits; it is known from small islands between Borneo, Celebes and the Philippines, but not as yet on the surrounding mainlands.

* 269. CARPOPHAGA RADIATA (Q. G.).

Grey-band Imperial Pigeon.

a. **Columba radiata** *(I)* Quoy & Gaim., Voy. Astrolabe, Zool. 1830, I, 244, pl. 26; *(II)* Prév. & Knip, Pig. II, 1838—43, pl. 29.

Carpophaga radiata *(1)* Gray, Gen. B. II, 469, Nr. 23 (1844); *(II)* Rchb., Columbariae t. CXXXVIII, f. 1287 (1848); *(3)* Wall., Ibis 1865, 387, 398; *(3bis)* id., Malay Archip. 1869, II, 431; *(4)* Schl., Mus. P.-B., Columbae, 1873, 93; *(5)* Brüggem., Abh. Ver. Bremen 1876, V, 86 (Sangir!); *(6)* Rosenb., Malay. Archip. 1878, 275; *(7)* Guillem., P. Z. S. 1885, 557; *(8)* W. Blas., Ztschr. ges. Orn. 1885, 307; *(9)* id., Ornis 1888, 617 (Sanghir!); *(10)* Salvad., Cat. B. XXI, 1893, 210; *(11)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 15; *(12)* Grant, Ibis 1896, 461, 476.

b. **Zonoenas radiata** *(1)* Bp., Compt. R. 1854, XXXIX, 1076; *(2)* id. ib. 1855, XL, 217, Nr. 102; *(3)* Rchb., Tauben, text 1862, 112; *(4)* Wald., Tr. Z. S. VIII, 1872, 84; *(5)* Meyer, Ibis 1879, 135 (Sangi!), 136; *(6)* id., Isis, Dresden 1884, 6 (Sangi!).

c. **Zonaenas radiata** *(1)* Bp., Consp. II, 1854, 38.

d. **? Carpophaga gularis** *(1)* Brüggem., Abh. Ver. Bremen 1876, V, 101 (Sangir!).

"Takura", Minahassa, Guillemard 7, Nat. Coll.

"Kua kua" (as also *C. paulina*), Tjamba Distr., Platen 8.

For further references cf. Salvadori *10*.

Figures and descriptions. Quoy & Gaimard *a I*; Knip *a II*; Reichenbach *II*; Bonaparte *c 1*; Brüggemann *5* (juv.); Salvadovi *10*; Grant *12*.

Adult. Head and under-parts grey, darker on nape, whiter on forehead, more rosy on breast; chin and upper throat white, passing into the surrounding grey; lower abdomen and flanks browner; under tail-coverts chestnut (paler in some examples); hind neck purplish black; back, wings, rump, and upper tail-coverts dark parrot-green, washed with maroon-purple on the mantle, where it passes into the dark patch on the neck; primaries black, externally with greenish blue reflections; tail above black, externally with blue reflections and washed with the green of the back, with a broad band of dark grey across the middle; tail below blackish, the outer feathers browner, the grey band below as above; under wing-coverts slaty brown, green near the metacarpal edge; quills below dusky brown, the three outermost broadened at the middle on the inner web, and then suddenly scalloped out, forming a notch. "Iris, outer ring red, inner yellow (or orange; orbits greenish); bill brownish black (or olive-green, black at tip); feet dull red (coral-red)" — Guillem. 7, Wall. *3*. (Between Manado and Arakan, Aug.—Sept. 1892: Nat. Coll. — C 10913.)

Sexes. The sexes are similar in coloration (Guillem. 7, Salvad. *10*).

Young. Hind neck and mantle coppery without the blue-black patch; head above pale drab;

lower abdomen and under tail-coverts cinnamon-chestnut; bar on the tail narrow and ill-defined (Manado — Arakan, VIII.—IX. 1892: Nat. Coll. — C 10914).

Measurements (7, Minahassa). Wing 207—219 mm; tail c. 130—140; tarsus 27; bill from first feathers 17.5—19.

Distribution. Celebes: — Minahassa (Quoy & Gaimard *a I*, Forsten *4*, etc.); Macassar (Wallace *3*, *b 4*, *10*); Tjamba Distr. (Platen *8*).

This Pigeon was one of the discoveries of Quoy & Gaimard made during the stay of the "Astrolabe" at Manado in July, 1828. It seems to be one of the rarer Pigeons in the Minahassa. From the Southern Peninsula there are two specimens in the British Museum from Mr. Wallace and one in the Brunswick Museum from Dr. Platen; here also it must, therefore, be accounted rare. We have not received the species from any of the islands off the coast, and we suspect that it affects chiefly the hills of the mainland. Two specimens were recorded from Sangi by Brüggemann, and the locality was accepted without query by Meyer and Salvadori. Prof. W. Blasius *(9)* evidently had some doubts about it. The species was not met with in Sangi by any other collector. Several species of Fischer's collection somehow or other got mislabelled; in the present case the similarity of this Pigeon to the "Wakian Sangi" (Sangi Dove — *Ptilopus gularis*) may have had something to do with it. The "Wakian Sangi" (whether it be *P. gularis* or *C. radiata*) probably does not belong to Sangi, any more than the "Barbary Dove" *(Turtur risorius)* belongs to Barbary; but such names are misleading, and in the present case even Brüggemann *(d 1)* seems once to have committed the error of calling *C. radiata*, *Carpophaga gularis*.

Count Salvadori places this species in his subgenus *Zonophaps*, which is typified by the Celebesian *C. forsteni* (Prév. & Knip). From this particular species *C. radiata* is unquestionable far removed, though standing nearer to other members of *Zonophaps*, such as *finschi* of New Ireland; but the peculiar cut of the first three primaries (see description) seems to be shared by no other Pigeon, and it might be best to place it in a subgenus for itself. Among Celebesian Pigeons it most resembles *Ptilopus gularis*, which is distinguishable by its maroon gular stripe, yellow bill, absence of grey tail-band, etc. A near relative of *C. radiata* has recently been discovered in Mindoro by Mr. Whitehead, *C. mindorensis* Grant. This is a species of very large size, but in coloration like *C. radiata*. The under tail-coverts, however, are grey, and there is a greyish black patch surrounding the eye and ear-coverts (Grant *12*).

* 270. CARPOPHAGA FORSTENI (Bp.).

Green-and-white Imperial Pigeon.

a. **Columba forsteri** (errore), *(I)* Prév. & Knip (nec Wagl.), Pig. II, 1838—43, pl. 47 (ex Temm. MS.).

b. **Carpophaga forsteri** *(1)* Gray, Gen. B. II, 469, Nr. 17 (1844).

c. **Carpophaga albigularis** *(1)* Gray (nec Temm., nec Bp.)—fide Bp., Compt. Rend. XXXIX, 1854, 1077.

d. **Hemiphaga forsteni** *(1)* Bp., Consp. II, 1854, 39; *(2)* id., C. R. XXXIX, 1854, 1077; *(3)* Wald., Tr. Z. S. 1872, VIII, 84; *(4)* Salvad., Ann. Mus. Civ. Gen. VII, 1875, 672; *(5)* Meyer, Ibis 1879, 58, 137; *(6)* Platen, Gefied. Welt 1887, 218; *(7)* P. & F. Sarasin, Z. Erdk. Berlin 1895, XXX, 328.

Carpophaga forsteni *(1)* Gray, List B. Br. Mus., Columbae, 1856, 22; *(2)* Schl., Handl. Dierk. 1857, 409; *(3)* Wall., Ibis 1860, 141; *(4)* id., Ibis 1865, 387, 398; *(5)* id., Malay Archip. 1869, I, 431; *(6)* Schl., Mus. P.-B., Columbae, 1873, 93; *(7)* Rosenb., Malay. Archip. 1878, 275; *(8)* Salvad., Cat. B. XXI, 1893, 208; *(9)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 15; *(10)* iid., ib. 1896, Nr. 1, p. 14; *(11)* Hart., Nov. Zool. 1896, 163.

e. **Zonoenas forsteni** *(1)* Rchb., Tauben 1862, 113, 204, t. V, f. 61.

"Tutup", Minahassa, v. Rosenb. *5*, or **"Tootoop"**, Nat. Coll., or **"Tuptup"**, Meyer *d 5*.

For further references cf. Salvadori *8*.

Figures and descriptions. Knip *a I*; Reichenbach *e I*; Bonaparte *d 1*; Salvadori *8*.

Adult. Head grey, whitish on forehead and malar region; chin and upper throat white; jugulum, breast, neck and upper parts dark parrot-green, with a golden gloss; hind neck inclining to dark red in places (in this specimen); mantle and interscapulary region greyish purple, redder on the shoulders; quills above dusky, the exposed surfaces metallic green; tail above green like the wings, crossed by a broad (3 cm) band of dark grey about $^1/_3$ from the end; tail below black, the band white; abdomen white; under tail-coverts dark cinnamon-rufous (almost chestnut); sides of body and under wing-coverts slaty green; quills below dusky: "bill black; orbits and feet deep red; iris orange-yellow" — Wallace *4* (Minahassa, v. Musschenbr. — Nr. 13374).

Sexes. The sexes are similar (Salvad. *d 4*, *8*).

Observations. Fine prismatic hues of purple and light blue are displayed by this Pigeon on the mantle and interscapulary region, quills, and the green parts of the tail, when seen in the proper light. The green contour-feathers do not show the reflections, but, on making their bases visible, the same tints are reflected from the basal parts.

As in so many Pigeons, the first primaries are of abnormal shape, the first quill being considerably scalloped out on the inner web and then broadened again towards the end; the second quill and, to a slight extent, the third are modified in a corresponding manner.

Measurements. Wing 255—267 mm; tail c. 170; tarsus c. 33; bill from first feathers 21.5—24.

Distribution. Celebes — Minahassa: Tondano (Forst. *6*, Wall. *3*, *8*, Nat. Coll.), Kakas (Meyer *d 5*), Rurukan (Platen *d 6*, P. & F. Sarasin *9*); Central Celebes, Takalekadjo Mts. (iid. *d 7*, *10*); South Celebes, Bonthain Peak (Everett *11*).

Forsten's *Carpophaga* is the largest Pigeon of the mainland of Celebes, and its peculiar plumage, wrapping it up, as it were, to the nape in a robe of dark golden green, leaving the head grey and belly white, makes it a striking species. Till recently it had been recorded only from the Minahassa, and even there it is rather scarce, and seems to be confined to the hills. Probably all the specimens labelled Manado were obtained on the hills nearer or further from the town. Dr. Platen, who met with a flock at Rurukan, speaks of its cry as *Carpophaga*-like, hollow, groaning, like strokes on a drum, as is also observed

by the Sarasins. This is a very distinct species, the only known form with which it has near affinities being *C. poliocephala* of the Southern Philippines, a smaller bird, with a rufous-chestnut throat and vinous-white breast (Salvad. 8). Count Salvadori makes it the type of his *Carpophagine* subgenus *Zonophaps* including therein, besides *C. radiata*, four species from Papuasia and the Moluccas, which, however, can claim no very near relationship with the Celebesian bird.

* 271. CARPOPHAGA POECILORRHOA Brügg.

Long-tailed Imperial Pigeon.

Carpophaga poecilorrhoa *(1)* Brüggem., Abh. Ver. Bremen 1876, V, 84; *(2)* Salvad., Cat. B. XXI, 1893, 220; *(3)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 15; *(IV)* Meyer, Vogelskel. 1897, II, pl. CCXXX.

a. **Gymnophaps poecilorrhoa** *(I)* Pelz., Verh. z.-b. Ges. Wien 1876, XXVI, 720, pl. XIII; *(II)* Gld., B. New Guinea V, pl. 60 (1880); *(3)* Meyer, Ibis 1881, 169; *(4)* W. Blas., J. f. O. 1883, 142; *(5)* Heine & Rchw., Nomencl. Mus. Hein. 1890, 282.

b. **Carpophaga (Ducula)** sp. *(1)* Lenz, J. f. O. 1877, 378.

Figures and descriptions. Meyer *IV* (skel.); Gould *a II*; Pelzeln *a I*; Brüggemann *1*; Lenz *b 1*; Salvadori *2*.

Adult. Head, neck, breast and upper abdomen grey, paler on forehead and chin, browner on hind head and neck, slaty on lower hind neck, tinged with vinaceous on breast and jugulum, the feathers of the lower breast and upper abdomen terminally bordered with cinnamon; entire back, upper tail-coverts and wings dark bronze-brown, glossed with green; tail black, tipped with whitish; sides, flanks and crissum dark brown, the feathers terminally fringed with cinnamon; under tail-coverts dark brown, broadly fringed on both webs with light cinnamon; under wing-coverts dark bronze with a greenish gloss; quills below dusky brown: "iris blood-red; bill-base violet-red, tip grey-green; feet and naked periocular ring cherry-red" — Platen in Nehrk. Coll. (♂, Tomohon, 6. IV. 94: P. & F. Sarasin).

Female. Like the male. — "Feet cherry-red; base of bill red" (♀, Rurukan, 18. III. 94: P. & F. Sarasin).

Immature. Like the adult, but the cinnamon terminal edgings on the under surface extending up to the chest, the quills and greater wing-coverts edged and tipped with dark cinnamon, the middle wing-coverts tipped with the same colour, the hind neck darker and browner, merging imperceptibly into the colour of the back. Wing 227 mm; tail 185 (Lotta, Minahassa, 21. VI. 93: Nat. Coll. — C 12110).

Measurements (4 adults). Wing 232—245 mm; tail 195—210; tarsus c. 28; bill from first feathers 20.5—22.5. For the loan of one of these specimens (Rurukan: Platen) we are indebted to Mr. Nehrkorn. We have also been able to examine another of Platen's specimens, a female kindly lent to us by Count Berlepsch.

Distribution. Celebes: — Minahassa (Fischer *1*, v. Musschenbr. *a 3*), Rurukan (Platen, P. & F. Sarasin), Tomohon (iid.), Lotta (Nat. Coll.).

This remarkable Pigeon, the only member of Salvadori's *Carpophagine* subgenus *Cryptophaps*, is at present known only from the mountains of the Minahassa. As to its affinities Count Salvadori remarks: it "does not seem to

have any near allies; perhaps it approaches *Ducula* [a *Carpophagine* group ranging from India to the Sunda Islands] more than any other generic or subgeneric group; the long and nearly graduated tail is very conspicuous, also the under tail-coverts with dark centres". The unusually long tarsal feathers, covering the bone down to the base of the toes, is another peculiarity. Among Celebesian birds it resembles in some ways *C. rosacea*, which is distinguishable by its chestnut under tail-coverts and pale vinous head.

In the "Catalogue of the Pigeons", 1893, Count Salvadori recognises 43 species of the genus *Carpophaga*, forms varying of course very much in value, some being only well-marked local races, others very distinct. While maintaining, and amending where necessary, the subdivisions of Bonaparte and others, Count Salvadori does not pull this uniform body of Pigeons to pieces, but, by a considerate application of the term "subgenus", he draws attention to the different groups of which the genus is composed and their relation to one another, using names indeed for signs, but not separating the groups under these names from *Carpophaga*. For this the student is grateful to the writer of the Catalogue; he sees at once that he has to do with a characteristic group of birds and soon becomes aware of the class of factors of which it is composed.

Carpophaga ranges from India to the Solomons and Fiji, and, in point of number of species, Papuasia is the richest division of its range. In peculiar forms, however, the Island of Celebes and the Philippines are the best off. Count Salvadori finds indeed that three subgenera occur in Celebes, and a like number in Papuasia and in the Philippines, but his subgenus *Zonophaps* is a somewhat heterogeneous one and falls naturally into three groups, two of which occur in Celebes. The following key shows the distribution of the subdivisions of *Carpophaga*:

Subgenera	S. E. Asia	Gt. Sundas	Lr. Sundas	Philippines	Celebes	Moluccas	Papuasia	Polynesia
Carpophaga	*	*	*	*	*	*	*	*
Ptilocolpa	.	.	.	*				
Zonophaps								
a. (*C. forsteni*-type)	.	.	.	*	*			
b. (*C. radiata*-type)	.	.	.	*	*			
c. (*C. basilica*-type)	.	.	.	.	.	*	*	
Ducula	*	*						
Cryptophaps	.	.	.	.	*			
Zonoenas	.	.	.	.	.	.	*	

Under the circumstances it would not be safe, with our present knowledge, to attempt to trace the *Carpophagine* population of Celebes to a source in either the Indian or Papuan Zoological Regions; on the other hand, it appears as likely

that Celebes itself was the land of exodus of the genus. The Celebesian species have affinities on all sides, but somewhat the strongest with the Philippines: *C. forsteni*, *C. radiata* and *C. paulina* are most nearly related to Philippines forms, *C. poecilorrhoa* apparently to Oriental ones; *C. rosacea* is a Lesser Sundan species.

GENUS MYRISTICIVORA Rchb.

In structure like *Carpophaga*, but easily distinguished by its general plumage of cream-white, with black wings and tail for the greater part. Five species occurring from the Malay Peninsula to Australia; one or two of them "insular" and of wandering habits.

272. MYRISTICIVORA BICOLOR (Scop.).

Insular Nutmeg Pigeon.

a. **Pigeon ou Ramier blanc mangeur de muscade de la Nouvelle Guinée** *(I)* Sonnerat, Voy. Nouv. Guin. 1776, 168, pl. 103.

b. **Columba bicolor** *(1)* Scop., Del. Flor. et Faun. Insubr. 1786, II, 94, Nr. 97; *(2)* Schl., Handl. Dierk. 1857, 410.

c. **Columba alba** *(1)* Gm., S. N. 1788, II, 780; *(2)* Less., Tr. d'Orn. 1831, 469.

d. **Columba littoralis** *(I)* Temm. & Knip, Pig. I, 1808—11, pl. 7.

e. **Carpophaga bicolor** *(1)* Gray, Gen. B. App. p. 23 (1849); *(II)* Cassin, U. S. Expl. Exp. Orn. 1858, 265, pl. 28; *(3)* Pelz., Novara Reise, Vög. 1865, 107; *(4)* Wall., Ibis 1865, 386; *(5)* Schl., N. T. D. III, 1866, 203, 205, 343, partim; *(6)* Ball, Str. F. I, 1873, 79; *(7)* Schl., Mus. P.-B., Columbae, 1873, 98, pt.; *(8)* Salvad., Cat. Ucc. Borneo 1874, 292; *(9)* Hume, Str. F. II, 1874, 80, 84, 96, 103, 114, 119, 264; *(10)* Sharpe, P. Z. S. 1875, 108, pt.; *(11)* Brüggem., Abh. Ver. Bremen V, 1876, 85; *(12)* Kelh., Ibis 1881, 527; *(13)* Oates B. Br. Burm. 1883, II, 303; *(14)* Vorderman, Nat. T. Ned. Indie 1883, XLII, 227; *(15)* Koorders, ib. 1889, XLVIII, 44, 115; *(16)* Everett, J. Str. Br. R. A. S. 1889, 195; *(17)* Whitehd., Ibis 1890, 56; *(18)* Sharpe & Whitehd., t. c. 135; *(19)* Sh., ib. 284; *(20)* Oates, ed. Hume's Nests & Eggs Ind. B. II, 1890, 369; *(21)* Vorderm., N. T. Ned. Ind. 1891, L, 507; *(22)* id., Notes Leyd. Mus. 1891, 129; *(23)* Ev., Ibis 1894, 241; *(24)* id., ib. 1895, 32.

Myristicivora bicolor *(1)* Bp., Consp. II, 1854, 36; *(II)* Rchb., Tauben 1862, 116, t. 229, figs. 1278—79, et p. 182, t. VI, f. 64—65; *(3)* Wald., Tr. Z. S. VIII, 1872, 84; *(4)* id., ib. IX, 1875, 217; *(V)* Salvad., Ann. Mus. Gen. IX, 1876, 62, 270—276, fig. 3; *(6)* Sharpe, Tr. L. S. (2) I, 1877, 347, 353; *(7)* Meyer, Ibis 1879, 136; *(7bis)* Wardl. Rams., Tweedd. Orn. Works, Index 1881, 659; *(8)* Salvad., Orn. Pap. III, 1882, 107; *(9)* Sclat., P. Z. S. 1883, 51, 195, 200; *(10)* W. Blas., J. f. O. 1883, 118; *(11)* Kutter, t. c. 315; *(12)* Meyer, Ztschr. ges. Orn. 1884, 194; *(13)* Guillem., P. Z. S. 1885, 271, 416, 558, et pt. 575; *(14)* id., Cruise "Marchesa" 1886, II, 3; *(15)* Salvad., Ibis 1886, 153; *(16)* W. Blas., Ztschr. ges. Orn. 1886, 197; *(17)* Salvad., Ann. Mus. Civ. Gen. (2) IV, 1887, 559; *(18)* W. Blas., Ornis 1888, 617, 642; *(19)* Steere, List Coll. B. & M. Philipp. Is. 1890, 24; *(20)* Salvad., Agg. Orn. Pap. 1891, III, 184; *(21)* id., Ann. Mus. Civ. Gen. 1892, (2) XII, 140; *(22)* id., Cat. B. XXI, 1893, 227; *(23)* Sharpe, Ibis 1894, 257; *(24)* M. & Wg., J. f. O. 1894, 248; *(25)* Bourns & Worc., B. Menage Exp. 1894, 30; *(26)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 15; *(27)* Hart., Nov. Zool. 1896, 180, 536.

f. **Myristicivora luctuosa** *(1)* Hickson, Nat. in N. Celebes 1889, 93, pt. (Talaut).

"Kum-kum puti", Malay, Celebes, Meyer 7, Nat. Coll.

"Kum-kum puti besar" or **"Kum-kum pulo"** (indifferently for this species and *M. luctuosa*), Malay, Minahassa, Nat. Coll.

"Puntün", Minahassa, Meyer, or **"Putijen laker-laker"** or **"Putijen togo-togo"** (both also for *M. luctuosa*), Nat. Coll.

"Kelau", Minahassa, Meyer 7.

"Punting" or **"Puntang"**, Biarro, to Great Sangi, Nat. Coll.

"Puantinga", Kabruang, Nat. Coll.

For further synonymy and references cf. Salvadori *22*.

Figures and descriptions. Knip *d I*; Cassin *e II*; Sonnerat *a I*; Reichenbach *II*; Bonaparte *1*; Hume *e 9*; Salvadori *V, 22*; Oates *e 13*; Vorderman *e 14*.

Adult. White, saturated with intense cream-yellow; quills and winglet black (sometimes powdered with grey), the four or five innermost secondaries yellowish white like the back; exposed terminal part of tail black, narrowing to a terminal band of about 1 cm on the outermost, the exposed parts of the outer web of which are mostly black; under tail-coverts yellowish white, but in some specimens (? younger birds) with dusky or black marks at or next the tips of the feathers: "iris dark brown; legs and feet pale smalt blue; bill leaden blue, tip darkish horny or dark plumbeous" — Nicobars, Davison *e 9* (near Manado, Aug.—Sept. 1893: Nat. Coll. — C 10925; and others).

Sexes. Similar in coloration.

Remark. The rich buff tint seen in fresh skins soon fades in the latter on exposure to light, leaving the bird almost pure white. The sprouting feathers are nearly orange.

Young. The young ones show more yellowish tints (Meyer 7). "All the feathers of the upper surface are broadly tipped with pale buff, and the under surface is a good deal tinged and mottled with this same colour" (Hume *e 9*).

Measurements. (10, Minahassa and neighbouring islets) wing 229—240 mm, (10, Sangi Islands) wing 224—241, (2, Kabruang) wing 233, 237; tail ca. 125; tarsus ca. 30; bill from first feather 20.5—22 mm.

Egg. 1 in number; longish oval, a good deal pointed towards the small end, pure white and tolerably glossy (Nicobars — Hume *e 20*).

Nest. Of sticks and twigs; in a low mangrove bush (Nicobars — Wimberly *e 20*).

Breeding time. Breeds in the Nicobars in January, February and March (Davison *e 20*).

Distribution. Islands of the Bay of Bengal, — Great Cocos, Barren, Narcondam, Andamans and Nicobars (Hume *e 9*); Mergui Islands (Blyth *e 13*); Cochin China (St. Pierre *22*); Siam (Mouhot *8*); Penang (Pinwill *8*); Malacca (Maingay *22*); Islands south of Malacca (Kelham *e 12*); Nias and Engano (Modigl. *17, 21*); Banka (v. d. Bossche *e 7*); Billiton (Vorderman *e 21*); S. Borneo (Schwaner *e 7*); N. Borneo (Everett and Pryer *e 16*); Labuan (Mottley *e 16*); Balabac (Steere *6*, Everett *e 24*); Palawan (Steere *6*, Whitehead *e 17*); Negros, Guimaras, Siquijor, Mindoro, Masbate, Marinduque, Nipah, Malanipa, Sakuyok, Mindanao (Steere *19*, Koch & Schadenb. *11*, Meyer *4*, Everett etc. *7bis*, *22*, *25*); Sooloo Id. (Guillemard *13*, *23*); Bongao (Everett *23*); Tawi Tawi (B. & W. *25*); Talaut — Kabruang and Karkellang (Nat. Coll. in Dresden and Tring Mus.); Sangi Islands — Gt. Sangi (Rosenberg *e 7*, Fischer *e 11*, Platen *18*, Nat. Coll.); Siao (Hoedt *e 7*, Nat. Coll.); Tagulandang, Ruang and Biarro (Nat. Coll.); N. Celebes — Manado tua and Mantehage (iid.); Minahassa (Meyer 7, P. & F. Sarasin, Nat. Coll.); Gorontalo Distr. (Meyer 7, Riedel *16*); Djampea (Everett *27*); Java (Horsfield *8*, Kuhl & v. Hasselt *e 7*,

Vorderman *e 14*); Karimon-Java Is. (Koorders *e 15*); Tenimber Islands (H. O. Forbes *9, 22*, Riedel in Leyd. M.); Halmahera, ? Ternate, Morty, Ceram, Amboina, ? Weeda, Matabello, Waigiou, Salawatti, Misol, Kei, Aru, North-west New Guinea, Karimtua Id. near Sorong, Karanton (S. Müller, v. Rosenb., Wallace etc. *8, 20*).

Like *Carpophaga concinna* and *pickeringi* and *Caloenas nicobarica* this white Pigeon is of what we have called insular habits. On the whole it avoids the large islands, and when it occurs on them it is at such points as are near the sea, such as the Northern Peninsula of Celebes and the Western Peninsula of New Guinea. It certainly seems to have a predilection for small islands; thus, when the "Marchesa" passed close to Bancoran — "a lonely lagoon islet of the San Miguel group — its lofty trees appeared literally covered with thousands of snow-white birds, which from their colour and flight could have been none other than the Bornean Nutmeg Pigeon *(Myristicivora bicolor)*"; while Davison *(e 9)* speaks of it as occurring on some of the Nicobars in almost incredible numbers, though on other islands of the group it is absent. Mr. Whitehead *(e 18)* writes: "This beautiful Pigeon is seldom met with on large islands, but loves to frequent the small islands round the coast, in which it at times fairly swarms. It affects the tops of the high fruit-bearing forest-trees, when on looking up sometimes you may see a tree fairly alive with them, and the birds themselves squabbling, feeding, and driving one another about from branch to branch". Meyer writes in his diary that great flocks of this pigeon were to be seen literally hanging in white clusters on the waringin trees near the shore of Manado tua, an island which it takes a few hours to boat round. The preference of these Pigeons for small islands is a mystery. Do they assemble thus on small islands for protection against Birds-of-prey, feeling strength in numbers like a flock of sheep, or against the ravages of lizards and small mammals on their nests?

Moreover, these sociable Pigeons are not stationary in most of their tropical island-haunts; and no wonder, for it is evident that such masses of individuals must soon eat up an island, so far as their peculiar fruit-food is concerned. There were none on Great Cocos when Hume was there, but the lighthouse-keeper told him they appeared at certain seasons in great numbers, and Davison, going about a month later, found them abundant. Hume remarks that "to the Andamans and the Great Cocos, Barren Island and Narcondam it is a seasonal visitant". Among the wooded islands to the south of the Malay Peninsula it is not uncommon "at certain seasons", according to Kelham *(e 12)*. Whitehead *(e 18)* has "often seen them at sea, making flights from island to island, no doubt in quest of fresh fruit-trees"; and Meyer *(7)* observed them crossing the broad sea-arms which separate the different small islands near Manado. So also during the Voyage of H. M. S. "Fly" (1847, 157) J. B. Jukes observed white Pigeons, which he calls *C. luctuosa* (probably *C. spilorrhoa*), migrating in numerous small flocks across the islands of Torres Straits. And yet there are writers who will point to such a bird as this for proof that the islands it inhabits must

have stood in recent land-connection with one another! But, whatever be the cause of its oceanic and wandering habits, it is evident from its numerical abundance that the race thrives from them, though, according to Davison's inquiries in the Nicobars, the female lays only one egg at a sitting; and, one cannot help thinking that if the birds would disperse to some extent, wander about the great islands, and lay two eggs (as, indeed, Meyer was told they do in Celebes) that they would soon overrun the East Indies, causing many weaker *Carpophagine* forms to go to the wall. That this calamity does not happen may, with our present knowledge, be perhaps most safely ascribed to the superior local knowledge of the endemic *Carpophagine* species of the large islands (knowledge of feeding-grounds, enemies, etc. being their strength), while strong social instincts check the individuals of *M. bicolor* from scattering and looking out each for himself and his partner in a more solitary manner.

Within the eastern bounds of the range of *M. bicolor* a closely related white Pigeon, *M. spilorrhoa* (G. R. Gray), is found, its distribution being from North Australia as far as West New Guinea and some of the neighbouring Papuan islands, where, as in Aru and perhaps Salawatti, it and *M. bicolor* occur together. Count Salvadori distinguishes *M. spilorrhoa* by the regular subapical black spots on its under tail-coverts, vent- and some of the flank-feathers; also the tip of its bill is pale yellow (Gould), that of *M. bicolor* dark horn. Whether the two species breed in the same localities seems very doubtful, both being of wandering habits.

M. luctuosa, which is peculiar to Celebes and Sula, has the quills densely powdered with mealy grey, the innermost secondaries being like the rest (not white as in *bicolor*), the tip of the bill yellow, the outermost tail-feathers either quite white with a black space on part of the outer web, or with a narrow tip of black also.

The plumage of *Myristicivora* is striking and unusual, white birds being altogether rare in nature; Swans, Herons, the Bell-bird are other examples.

Nevertheless Mr. Whitehead says they are extremely hard to detect from under the trees in which they are sitting; but, from the remarks of other authors, this evidently is not the case when the birds are seen from a side-point of view. From philosophic considerations its tail is of especial interest; when at rest the exposed terminal part is black, but the basal part, which is concealed above beneath the white under tail-coverts, is white[1]). We believe it is in some way connected with the action of light, which seems to affect the pennate feathers of the wings and tail more quickly than the plumaceous feathers of the rest of the body.

Another point of interest is the creamy yellow tint of its plumage in life, which fades quickly in stuffed specimens. It looks a good deal like the yellow tint seen in *Cacatua sulphurea*, which Krukenberg (Vergl.-physiol. Studien,

[1]) For a similar and more striking illustration: cf. *Graucalus bicolor* p. 413 *antea*.

1882, II, 2. Abth. p. 35, sep. copy) ascertained to be *Psittacofulvin*, and which soon fades in this Cockatoo also when the bird is stuffed and exposed to the light. As both are fruit-eating birds it would not be surprising if the pigment proved to be the same in both. We are not aware that it has been investigated in the Pigeon.

* 273. MYRISTICIVORA LUCTUOSA (Temm.).

Mainland Nutmeg Pigeon.

a. **Columba luctuosa** *(I)* Temm., Pl. Col. 247 (1825); *(2)* Less., Man. d'Orn. 1828, II, 163; *(III)* Prév. & Knip, Pig. II, 1838—43, pl. 40.

b. **Carpophaga luctuosa** *(1)* Selby, Natur. Libr., Pig. 1835, 119; *(2)* Schl., Handl. Dierk. 1857, 410; *(3)* Wall., P. Z. S. 1862, 335, 344; *(4)* id., Ibis 1865, 386, 398; *(5)* Schl., Ned. Tdschr. Dierk. III, 1866, 203, 343; *(6)* Wall., Malay Archip. 1869, I, 337; *(7)* Schl., Mus. P.-B., Columbae, 1873, 102; *(8)* Brüggem., Abh. Ver. Bremen 1876, V, 85; *(9)* Rosenb., Malay. Archip. 1878, 275.

Myristicivora luctuosa *(1)* Rchb., Syst. Av. Natur. 1852, p. XXVI; *(II)* id., Tauben 1862, 116, pt., t. 229, fig. 1277 (nec 1276); *(3)* Wald., Tr. Z. S. VIII, 1872, 84; *(4)* Salvad., Ann. Mus. Civ. Gen. IX, 1877, 265 and fol.; *(5)* id., P. Z. S. 1878, 89; *(6)* Meyer, Ibis 1879, 136; *(7)* Salvad., Orn. Pap. III, 1882, 111; *(8)* W. Blas., P. Z. S. 1882, 710; *(9)* id., J. f. O. 1883, 129, 139; *(10)* Joest, Das Holontalo 1883, 106; *(11)* Guillem., P. Z. S. 1885, 557; *(12)* W. Blas., Ztschr. ges. Orn. 1886, 132; *(13)* Hickson, Nat. in N. Celebes 1889, 93, pt. (Talissi); *(14)* Heine & Rchnw., Nomencl. Mus. Hein. 1890, 281 (Sulu!); *(XIVbis)* Meyer, Abb. v. Vogelskel. II, 1892, 51, pl. CLXXVI; *(15)* Salvad., Cat. B. XXI, 1893, 234; *(16)* Büttik., Zool. Erg. Weber's Reise Ost-Ind. 1893, III, 281; *(17)* P. & F. Sarasin, Ztschr. Erdk. Berlin 1894, XXIX, 361; *(18)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 15, *(19)* iid., ib. 1896, Nr. 2, p. 20; *(20)* Hart., Nov. Zool. 1897, 165.

"Putia", Gorontalo, Joest *10.*

"Putieja" [Gorontalo] v. Rosenb. *b 8.*

"Kum-kum puti besar" or **"Kum-kum pulo"**, Malay, Minahassa[1]), Nat. Coll.

"Putijen togo togo" or **"Putijen laker laker"**, Minahassa[1]), iid.

"Kum-kum puti" (= White *Carpophaga*), islands off the Minahassa[1]), iid.

"Putean", East Celebes, iid.

"Teon" or **"Utejon"**, Peling, Banggai, iid.

For further references cf. Salvadori *15.*

Figures and descriptions. Temminck *a I*; Knip *a III*; Reichenbach *II*; Schlegel *5*, *7*; Salvadori *4*, *15.*

Diagnosis. Similar to *M. bicolor*, but the innermost secondaries slate-grey like the other remiges, all densely powdered with mealy grey; many feathers on flanks and crissum slaty black terminally; outermost tail-feathers white, only a narrow space of black bordering part of the outer web, sometimes narrowly tipped with black; tip of bill yellow; average size larger than *bicolor* (♂, Kema, 29. Aug. 1893: P. & F. Sarasin, and others.

Iris black (Wall. *b 4*) or dark brown (Guillem. *11*); bill lead-blue or bluish green, yellow or horny yellow at the tip; feet lead-blue or bluish green *(b 4, 11).*

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[1]) These names are also given by our native collectors for *M. bicolor.*

Female. Just like the male, but is probably somewhat smaller (♀, Kottabangon, Mongondo Distr., 2. XII. 93: P. & F. Sarasin. Wing 232, tail 120 mm, as against wing 247, tail 140 in the above ♂).

Measurements (15 examples from N. Celebes and the islands off the coast). Wing 232—249; tail c. 120—140; tarsus c. 32; bill from feathers of forehead 21—23 mm.

Skeleton.

Length of cranium	63.0 mm	Length of tarso-metatarsus .	32.5 mm
Greatest breadth of cranium .	23.6 »	Length of digitus III . . .	46.5 »
Length of humerus	56.0 »	Length of sternum	61.4 »
Length of ulna	67.0 »	Greatest breadth of sternum .	41.0 »
Length of radius	60.0 »	Height of crista sterni . . .	23.5 »
Length of manus	72.0 »	Length of coracoideum . . .	44.0 »
Length of metacarpus . . .	38.4 »	Length of scapula	46.0 »
Length of digitus principalis .	35.3 »	Length of clavicula dextra .	36.0 »
Length of femur	47.3 »	Length of pelvis	74.0 »
Length of tibia	61.0 »	Greatest breadth of pelvis . .	41.5 »
Length of fibula	47.0 »		

Distribution. Celebes and Sula: — Minahassa (Forsten *b 7*, Wall. *b 4*, *15*, etc.); Lembeh, Banka, Mantehage and Manado tua (Nat. Coll. in Dresd. Mus.); Talissi (Hickson *13*); Mongondo Distr. (P. & F. Sarasin *17*); Gorontalo Distr. (v. Rosenb. *b 7*, Riedel *12*, Meyer *6*); East Celebes (Nat. Coll.); West Celebes (Doherty *20*); Luwu, Gulf of Boni (Weber *16*); near Macassar (Wallace *b 4*, *b 6*, *15*); Sula Islands (Allen *b 3*); Sula Besi (Bernstein *b 7*, Hoedt *b 7*); Sula Mangoli (Bernst. *b 7*); Peling and Banggai (Nat. Coll.)

This form of *Myristicivora* is confined to Celebes and Sula, and, though it is also found on the small islands close to the coast, it cannot be said to be of oceanic habits like the wide-spread *M. bicolor*. The latter is easily to be recognised by its having the four or five innermost secondaries white like the scapulars, and the nib of the bill dusky horn-colour, not yellow.

Some doubts have existed as to the number of tail-feathers in *M. luctuosa*, whether 12 or 14, and Prof. W. Blasius *(12)* has suggested the possibility that both numbers may normally exist in this Pigeon — that it may in fact be dimorphous. In a series of 17 examples in the Dresden Museum the majority have 14 tail-feathers, others 13, 12, or less; in the case of an odd number there is, of course, a feather missing, and in one case of 12 we can make out 2 feathers as missing, and we believe it will be found in all cases of 12 rectrices that the bird has moulted or otherwise lost 2 feathers. The allied *Myristicivora spilorrhoa* was originally believed to have only 12 rectrices (Cassin, U. S. Expl. Exp. 1858, 266; Walden *3*), but Dr. Sharpe has satisfactorily proved that the number is 14, as in the other *Myristicivorae* (P. Z. S. 1875, 108).

The white Pigeons of the genus *Myristicivora* belong to five species found from Siam and the Andamans as far as North Australia. From *M. luctuosa* all the other four species may be distinguished by their white inner secondaries. Perhaps *M. spilorrhoa* stands nearest to the Celebesian bird, since it has the nib of the bill yellow, and black spots on the flanks and crissum, but the under

tail-coverts are also spotted with black. The insular *M. bicolor* has probably established itself in recent times in the Northern Peninsula of Celebes, while *M. luctuosa* may be regarded as the original race of Celebes, and possibly as the most ancestral form of the group. But the young of Pigeons at once assume the adult dress, displaying no phylogenetic stages, so that we know of no proof for such an assumption as this last.

FAMILY COLUMBIDAE.

This family, which is typified by the Rock Dove, is distinguishable from the *Treronidae* (except *Phabotreron* and *Hemiphaga*) by the tail being composed of 12 rectrices, and the soles of the feet are less broad (see: Salvadori, Cat. B. XXI 1893, 3). Salvadori recognises three subfamilies of *Columbidae*, viz. *Columbinae*, *Macropygiinae*, and *Ectopistinae*; the first, in which *Turacoena* should, apparently, be included, having the tail shorter than the wing or equal to it, the two latter with the tail longer than the wing, but the Indo-Australian *Macropygiinae* with the feathers broad, and the *Ectopistinae*, consisting solely of the Passenger Pigeon of America, with the rectrices narrow and pointed (see Salvadori, p. 240).

GENUS COLUMBA L.

Tail shorter than the wing, square or slightly rounded; tarsus naked for more than the lower half; wing rather long, second primary (usually) longest, secondaries about $^1/_2$ to $^2/_3$ its length; nostril covered at the base with a membranous protuberance. The genus is cosmopolitan.

274. COLUMBA ALBIGULARIS (Bp.).

White-throated Pigeon.

a. **Janthoenas albigularis** *(1)* Bp., Compt. Rend. XXXIX, 1105 (11. Dec. 1854), (descr. null., ex Temm. in Leyd. Mus.); *(2)* id., ib. XL, 1855, 218, Nr. 125; *(3)* id., Coup d'oeil Ordre Pig. 1855, 21, 56, Nr. 125; *(IV)* Rchb., Tauben 1862, 118, 183, Novitiae t. VI, fig. 66, 67; *(5)* Salvad., Orn. Pap. III, 1882, 120; *(VI)* Sharpe in Gld. B. New Guinea V, pl. 67 (1888): *(7)* Salvad., Agg. Orn. Pap. 1891, 184.

b. **Janthoenas halmaheira** *(1)* Bp., Consp. II, 1854, 44.

c. **Carpophaga albogularis** *(1)* Gray, List Columbae Brit. Mus. 1856, 24.

d. **Carpophaga albogularis** *(1)* Schl., N. T. D. III, 1866, 206.

Columba albigularis *(1)* Salvad., Cat. B. XXI, 1893, 313; *(2)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 2, p. 20.

"Awung", Tagulandang and Ruang, Nat. Coll.

"Tatamba", Banggai, iid.

Figures and descriptions. Sharpe *a VI*; Reichenbach *a IV*; Salvadori *a 5, 1.*

For full synonymy cf. Salvadori *1.*

Adult. Blackish slaty; chin, throat, cheeks and ear-coverts white; head above glossed with magenta-purple, becoming more wine-purple on mantle, neck, and fore neck; upper parts and wing-coverts bordered with metallic bronze-green and purple; under parts more broadly bordered with purple-bronze; quills and tail above and below black; "bill red, tip white, iris ochre-orange; orbits red; feet dull coral-red, claws pale" — Wallace *1* (Tagulandang Id., Aug. 1894: Nat. Coll. — C 13446).

Immature. With the purple-red feathers of the jugulum and breast mixed with others of reddish brown (Ruang Id., Aug. 1894, Nat. Coll. — C 13448).

Young. "Throat ashy, metallic edges of the feathers less conspicuous, crown, lower part of front neck, and upper breast brownish; bill and feet brown" (Salvad. *1*).

Measurements (4 ex. Ruang and Tagulandang). Wing 224—240 mm; tail 135—150; tarsus 27—28; bill from feathers of forehead 21—22.

Distribution. From the Louisiade Islands, S. E. and N. W. New Guinea, Kei, Waigiou, Salawatti, Mysol, Ceram, Buru, Ternate, Halmahera, Morty, Raou (Salvadori *a 5*, *a 7*); Tagulandang and Ruang[1]) (Nat. Coll. in Dresden and Tring Museums); Banggai (Dresd. Mus. *2*).

This Pigeon is a new and somewhat unexpected addition to the avifauna of the Celebesian subregion. Several examples of it were shot by our native hunters in August, 1893, on the island of Tagulandang and on the volcano of Ruang or Gunong api (Fire Mountain), which rises from the sea close to the south of the former island. The volcano is active and dangerous; in 1871 a disastrous eruption, which was witnessed by Meyer, took place (Nature 1871, IV, 286; Rowl., Orn. Misc. 1878, III, 324). "Except on the E.S.E. side there was no green, not a tree to be seen, and here only sparingly and in strips. All that had remained from the eruption of the 27th August, 1870, was destroyed by that of the 2nd—14th March, 1871; before that time Ruang was clothed to its summit with vegetation. The narrowest place between Tagulandang and Ruang is about half an English mile" (Diary). Another eruption took place in 1874. When Dr. Hickson visited the island in 1885 it was only covered with underwood, and Hickson rightly concluded that the whole of the high forest has been destroyed during the eruption of 1871 (Nat. in N. Celebes 1889, 45).

One may assume that Ruang (though not Tagulandang) has been colonised by its present stock of birds chiefly since 1871, or, perhaps, since the second eruption of 1874, for the destruction of the forests means destruction of the food of the birds which dwell therein. These two small islands form the only point of the Celebesian subregion where the white-throated Pigeon occurs; its presence there is only to be accounted for on the ground of its having reached the islands by flight and, so far as Ruang is concerned, since 1871!

C. albigularis has close affinities with *C. hypoenochroa* (Gld.) of New Caledonia and the Loyalty Islands, which has the head above, neck and jugulum purple-chestnut, and *C. vitiensis* Q.&G. of Fiji, smaller with a reddish breast and blackish claws; also with *C. leopoldi* (Tristr.) of the New Hebrides, *C. castaneiceps*

[1]) By a lapsus calami we wrote Talaut for Ruang in 1896 *(2)*.

Peale of Samoa, *C. griseigularis* (Wall. & Lay.) of the Philippines and North Borneo (cf. Salvad. *1*) and *C. metallica* Temm. of Timor, Sumbawa, and Lombok. They belong to Reichenbach's genus *Janthoenas*, but Count Salvadori considers it impossible at present to define the various subgenera of the genus *Columba*, in which he includes 58 species.

The present species bears much resemblance to *Turacoena manadensis* (Q. G.) a resemblance which we believe to betoken real affinity, though the latter has a graduated tail, black bill and feet, etc.

GENUS TURACOENA Bp.

Differs from *Columba* in having the tail graduated and about as long as the wing, instead of markedly shorter and square or slightly rounded. Periocular region naked. Tarsus bare, except on the upper anterior portion. One species in the Celebesian area, and one in Timor.

* 275. TURACOENA MANADENSIS (Q. G.).

White-headed Pigeon.

a. **Columba manadensis** *(I)* Quoy & Gaim, Voy. Astrol. 1830, Zool. I, 248, pl. 30; *(II)* Prév. & Knip, Pig. II, 1838—43, pl. 46; *(3)* Schl., Handl. Dierk. 1857, 406.

b. **Macropygia manadensis** *(1)* Gray, Gen. B. II, 471, Nr. 8 (1844); *(II)* Rchb., Columbariae 1847, f. 1403, 1404; *(3)* Schl., Mus. P.-B., Columbae, 1873, 106; *(4)* Rosenb., Malay. Archip. 1878, 275.

Turacoena manadensis *(1)* Bp., Consp. II, 1854, 58; *(2)* id., Compt. Rend. XXXIX, 1854, 1112; *(3)* Wall., Ibis 1865, 390; *(4)* Wardl. Rams., Ibis 1890, 243; *(5)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 15; *(6)* iid., ib. 1896, Nr. 1, p. 14; *(7)* iid., ib. 1896, Nr. 2, p. 20; *(8)* Hart., Nov. Zool. 1896, 164; *(9)* id., ib. 1897, 165.

c. **Turacoena menadensis** *(1)* Wall., P. Z. S, 1862, 345; *(2)* id., Malay Archip. 1869, I, 431; *(3)* Wald., Tr. Z. S. VIII, 1872, 85; *(4)* Salvad., Ann. Mus. Civ. Gen. VII, 1875, 673; *(5)* Meyer, Ibis 1879, 137, 146; *(6)* W. Blas., J. f. O. 1883, 139; *(7)* Guillem., P. Z. S. 1885, 558; *(8)* W. Blas., Ztschr. ges. Orn. 1885, 308; *(9)* Salvad., Cat. B. XXI, 1893, 333.

d. **Macropygia menadensis** *(1)* Finsch, Neu-Guinea 1866, 178; *(2)* Brüggem., Abh. Ver. Bremen 1876, V, 87; *(3)* Büttik., Zool. Erg. Weber's Reise Ost-Ind. III, 1893, 281.

"Pombo itam kapala puti" (White-headed Black Dove), Malay, Minahassa, N. Celebes, Meyer *c 5.*

"Kapala puti" (White-head), Malay, Minahassa, Guillem. *c 7*, Nat. Coll.

"Trawuwu" (Meyer) or **"Tarwoowoo"** (Nat. Coll.), Minahassa.

"Padibubu", [Gorontalo] v. Rosenb. *b 4.*

"Putih Pili", Tjamba Distr., Platen *c 8.*

"Salilungun", Peling, Nat. Coll.

For further synonymy and references cf. Salvadori *c 9.*

Figures and descriptions. Quoy & Gaimard *a I*; Knip *a II*; Reichenbach *b II*; Bonaparte *1*; Schlegel *b 3*; Wardl. Ramsay *4*; Salvadori *c 9.*

Adult. Brownish slaty-black, the terminal margins of the feathers of back, upper tail-coverts and lesser wing-coverts with violet reflections in certain lights; occiput, nape,

neck, upper mantle, and jugulum glossed with coppery green; forehead, crown, sides of head, and throat pure white; under-parts slaty, with violet reflections in certain lights; tail above and below black; remiges above black, below blackish brown (♂, Kema, Nov. 1893: P. & F. Sarasin).

Naked periocular skin red (Wall. *3*, Saras.); iris yellowish (Saras.); bill and feet black (Wall. *3*, Platen *8*).

When the bird is seen in a horizontal position towards the light, the lustrous green of the nape and neck becomes dark blue.

Female. Similar to the male, but perhaps a trifle smaller (Salvad. *c 4*, *c 9*).

Young. "The nape, instead of being green, has steel-blue and violet reflections; the feathers of the breast and abdomen have pale brown edgings" (Salvad. *c 9*; Brügg. *d 2*; W. Blas. *c 8*).

Measurements (N. Cel. and neighbouring islets 12, S. Cel. 1, adults). Wing 195—205 mm; tail 180—205; tarsus c. 27; bill from feathers of forehead 19.5—20.5.

Distribution. Celebes and Sula: — Minahassa (Quoy & Gaimard *a I*, Forsten *b 3*, etc.); Banka, Lembeh, Mantehage and Manado tua (Nat. Coll.); Gorontalo Distr. (Rosenb. *b 3*, Meyer *c 5*); Togian (Meyer *c 5*); West Celebes (Doherty *9*); Kandari, S. E. Celebes (Beccari *c 4*); Luwu, Central Celebes (Weber *d 3*); Pare Pare (P. & F. Sarasin *6*); Tjamba Distr. (Platen *c 8*); near Macassar (Wallace *3*, *c 9*); Bonthain Distr. (Everett *8*); Sula Mangoli (Bernstein *b 3*); Sula (Allen *c 1*); Peling (Nat. Coll. in Dresd. and Tring Mus.).

The genus *Turacoena* consists only of the present species and of *T. modesta* (Temm.) of Timor, which is distinguishable from the Celebesian form by its crown and throat being slate-colour like the rest of its plumage. *T. manadensis* seems to occur all over Celebes as well as in Sula. It was discovered near Manado in 1828 by the naturalists of the "Astrolabe", and it is known as a common bird in North Celebes. As has already been pointed out, Timorese types — if found in North Celebes — may always be expected in the South, and in 1856 this Pigeon was rediscovered near Macassar by Mr. Wallace, and later at other points by Beccari, Platen, Weber, the Sarasins, Everett and Doherty. Its cry is described by Meyer as a very high note, "Kaukau", like a knock on an empty cask. It usually flies alone, and feeds on different fruits, such as the Chilli, *Capsicum fastigiatum* Bl., etc. Specimens from North and South Celebes do not seem to differ, but those from Sula are said by Count Salvadori *(c 9)* to be smaller. Two from Peling resemble immature Celebes examples, and are probably not adult.

The genus *Turacoena* is placed by Wardlaw Ramsay and Salvadori among the *Macropygiae*, and Schlegel, Brüggemann and Büttikofer do not separate it even generically from *Macropygia*. It appears to us to have no particularly close affinities with that genus, which it approaches only in having the tail graduated, though nothing like to an equal extent. The chestnut, rufous, and brown colours of *Macropygia* have nothing to do with the dark slate of *Turacoena*, and the plumage of *T. manadensis* suggests affinity with certain *Columbae*, such as *C. albigularis*, with which it agrees in certain points of structure. The bill is a good deal similar in shape in both the latter, the

nib of that of *Turacoena* being more rounded; both have a large space of naked periocular skin, smaller in *Macropygia*; all three have the sole of the inner toe broadened at its base, but most developed in *Turacoena*; the 7th, 8th and 9th quills (counting from carpus outwards) are considerably scalloped on the outer web; this is seen to a less extent in *Macropygia* and *Columba albigularis*, and other Pigeons. The correct position of *Turacoena* is somewhat doubtful, but it appears to be a transition-form from *Macropygia* to *Columba*, standing somewhat nearer to the latter.

GENUS MACROPYGIA Sw.

These Pigeons are smaller than a Rock-dove, and the tail, being longer than the wing and strongly graduated, with the outermost feather less than half the length of the longest, easily distinguishes them from other *Columbidae* in Celebes. The plumage of many species of the genus is barred below, and, with the graduated tail, gives remarkably Cuckoo-like appearance. It is probably a low type of *Columbine* plumage, as the young of *Chalcophaps*, a Ground-pigeon, is very similarly marked.

* 276. MACROPYGIA ALBICAPILLA Bp.

Celebesian Cuckoo-dove.

Plate XL.

A series of specimens from the islands between Great Sangi and Celebes has convinced us that it is quite impossible to uphold the specific distinctness of *M. sangirensis* Salvad.; we, therefore, treat of it as a local race.

1. The typical Macropygia albicapilla.

a. **Macropygia albicapilla** *(1)* Bp., Consp. II, 1854, 57 (ex Temm. Mus. Lugd.); *(2)* Wall., P. Z. S. 1862, 335, 345; *(3)* id., Ibis 1865, 389, 399; *(4)* Wald., Tr. Z. S. 1872, VIII, 85; *(5)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 672; *(6)* Meyer, Ibis 1879, 137, 146; *(7)* Salvad., Orn. Pap. III, 1882, 134; *(8)* W. Blas., J. f. O. 1883, 139; *(9)* Guillem., P. Z. S. 1885, 558 (partim?); *(10)* W. Blas., Ztschr. ges. Orn. 1886, 133—137; *(11)* Platen, Gefied. Welt 1887, 206; *(12)* W. Blas., Ornis 1888, 620; *(13)* Wardl. Rams., Ibis 1890, 232; *(XIV)* Meyer, Abb. v. Vogelskel. II, 1892, 50, pl. CLXXV; *(15)* Salvad., Cat. B. XXI, 1893, 353; *(16)* Büttik., Zool. Erg. Weber's Reise Ost-Ind. 1893, III, 287, 288.

b. **Macropygia amboinensis** var. **albicapilla** *(1)* Brüggem., Abh. Ver. Bremen 1876, V, 86, partim.

c. **Macropygia turtur** part. *(1)* Schl., Mus. P.-B., Columbae, 1873, 111, 112 (Celebes and Soula Bessie).

"Kuo", Minahassa, Nat. Coll.

"Kuwon" [Minahassa], Guillemard *a 9.*

"Kuo mera", Banka, Manado tua and Mantehage [Minahassa], Nat. Coll.

For further references cf. Salvad. *a 14.*

Descriptions. Meyer *a XIV* (skel.); Bonaparte *a 1*; Salvad. *a 5* (young), *a 15*; W. Blas. *a 12* (young); Wardl. Rams. *a 13*.

Diagnosis. Average size smaller; metallic cervical collar of male coppery-bronze, rarely with strong magenta-purple tints; the crown and under surface of the female usually less saturated with rufous chestnut.

Distribution. Celebes and Sula: — Minahassa (Wallace *a 3*, *a 15*, Rosenb. *c 1*, etc.), Banka Id. (Meyer *a 6*, Nat. Coll.); Manado tua and Mantehage (Nat. Coll.); Gorontalo Distr. (Rosenb. *c 1*, Meyer *a 6*); Togian (Meyer *a 6*); Posso (Meyer *a 6*); Macassar (Wallace *a 3*, *a 15*); Maros (if rightly determined — Guillem. *a 9*); Sula Besi (Bernst. *c 1*, Hoedt *c 1*); Sula (Allen *a 2*, *a 15*).

2. Macropygia albicapilla sangirensis (Salvad.).

d. **Macropygia turtur**, part. *(1)* Schl., Mus. P.-B., Columbae, 1873, 111 (Sanghir, Siao).

e. **Macropygia** sp. *(1)* Salvad., Ann. Mus. Civ. Gen. IX, 1876, 62; *(2)* id., Atti Ac. Sc. Tor. 1878, XIII, 1186.

f. **Macropygia sanghirensis** *(1)* Salvad., Atti Ac. Sc. Tor. 1878, XIII, 1185; *(2)* Meyer, Isis, Dresden 1884, 6; *(3)* W. Blas., Russ's Isis 1888, 78; *(IV)* id., Ornis 1888, 619, 642; pl. III; *(5)* Wardl. Rams., Ibis 1890, 233, 244; *(6)* Salvad., Cat. B. XXI, 1893, 354.

"Simbookoo", Siao, Nat. Coll.

"Buaho mohamo", Great Sangi, iid.

Figure and descriptions. W. Blas. *f IV*; Salvad. *f 1*, *f 6*; Wardl. Rams. *f 5*.

Diagnosis. Average size larger; metallic cervical collar of male usually magenta-purple; crown and under surface of female usually more saturated with rufous chestnut.

Distribution. Great Sangi (Rosenb. *d 1*, Hoedt *d 1*, etc.); Siao (Hoedt *d 1*, v. Duivenb. *d 1*, Meyer *f 2*, Nat. Coll.).

Observation. This race, besides being of larger size, has been held by Count Salvadori, Prof. W. Blasius and Major Wardlaw Ramsay to be recognisable by its having a darker upper surface. As far as the colour of this part is concerned we find it easy to match the Sangi race with specimens apparently of similar age from the mainland of Celebes and the intermediate islands. The darkest specimen we have seen is an adult male from Tagulandang (C 13461), with a bronze cervical collar. As seen by the measurements below there is a complete intergradation in point of size.

Macropygia albicapilla — sangirensis.

Intermediate forms.

"Simbookoo", Tagulandang, Ruang and Biarro, Nat. Coll.

Distribution. Biarro, Tagulandang and Ruang, between N. Celebes and Siao (Nat. Coll.).

The species.

Adult male. Above burnt-umber with a claret tinge, quills and tail duskier; entire hind-neck metallic bronze-green, the bases of the feathers bluish grey; sinciput, chin and throat almost white, passing into light cinnamon-rufous on the sides of the head, and jugulum, occiput and nape, on the latter parts washed with grey; breast crossed with rather broad subterminal bars of dark hair-brown, preceded by an irregular cinnamon bar and fringed terminally with white, the bases of the feathers

dusky grey; abdomen and under tail-coverts pale cinnamon-rufous, crossed with vermiculate hair-brown bars, the longest under tail-coverts darker and without bars; under wing-coverts, axillaries and inner edges of quills where they rest upon the body deep cinnamon-rufous; remiges below dark brown; tail strongly graduated, the three outer feathers more or less cinnamon-rufous, with an ill-defined subterminal blackish bar which is bluish grey below ([♂] near Manado, Aug.—Sept. 1893: Nat. Coll. — C 10927).

Adult male [younger?]. Like the above, but the cervical collar light metallic magenta-purple instead of metallic bronze-green; sinciput and throat light reddish cinnamon, instead of whitish; the hair-brown bars on the under-parts narrower. "Iris of two rings, the outer red, the inner bluish white; feet light red; bill black" (♂, Kema, 31. July, 1893: P. & F. Sarasin).

Male assuming the adult dress. Upper surface varied with feathers of dull liver-brown (new feathers!) like the adult, and with dusky brown feathers, broadly bordered and penultimately barred and vermiculated with deep cinnamon-rufous (old feathers!) like the young; cervix dusky brown, vermiculated with greyish and cinnamon (old feathers); occiput and jugulum cinnamon-rufous; forehead and throat whitish; under-parts much as in the adult male ([♂], Mantehage, 22. April, 1893: Nat. Coll. — C 12115).

Young. A specimen in what we take for the first plumage is blackish above, the wing-coverts, inner quills, lower back and upper tail-coverts broadly tipped with deep cinnamon-red, the feathers of hind-neck and mantle tipped and barred with paler cinnamon; head and nape deep cinnamon-red, the bases and lower sides of the feathers black; jugulum, breast and abdomen deep cinnamon-red, the breast-feathers crossed with subterminal dusky bars, those of the jugulum with most of the base black; the black subterminal patches on the tail well-defined (Ruang Id., 31. August, 1894: Nat. Coll. — C 13464).

Adult female. What we take for the old female is much like the young, but has the dark reddish bars of the upper surface much narrower and more obscure, the plumage approaching the almost uniform dull liver-brown of the male; head above and jugulum deep cinnamon-rufous; under-parts paler cinnamon with indications of vermiculate bars, best seen on the breast (Banka, 3rd May, 1893: Nat. Coll. — C 12116).

Nest-young. A few days old, nearly naked; with sprouting quills, sprouting feathers on sides of jugulum, thighs, back, etc. Ten primaries are present, as also a small greater covert situated distally over the tenth, but there is no trace of an eleventh primary (Tomohon, 22. IV. 94: P. & F. Sarasin).

Measurements of adults.	Wing	Tail	Bill from feathers of forehead
a. (Sarasin Coll.) ♂ ad., Kema, Minahassa, 31. VII. 93 . . .	158	190	15.5
b. (C 10826) [♂] ad., near Tondano, Aug.—Sept. 1892 (Nat. Coll.)	159	185	14.5
c. (C 10927) [♂] ad., near Manado, Aug.—Sept. 1892 (Nat. Coll.)	154	170	14.5
d. (Nr. 13391) [♂] ad., Minahassa (v. Musschenbr.)	160	190	—
e. (Nr. 13410) [♂] ad., Manado, March, 1871 (Meyer) . . .	159	200	—
f. (Nr. 13392) [♂] ad., Manado (v. Musschenbr.)	164	185	—
g. (Nr. 13412) [♂] ad., Gorontalo (Riedel)	165	190	—
h. (C 12111) [♂] ad., Banka Id., May, 1893 (Nat. Coll.) . .	158	200	15
i. (C 12114) [♂] ad., Banka Id., May, 1893 (Nat. Coll.) . .	156	195	14.5
j. (C 12112) [♂] ad., Mantehage, Apr. 1893 (Nat. Coll.) . .	160	185	14
k. (C 13461) [♂] ad., Tagulandang, Aug. 1894 (Nat. Coll.) .	164	195	16

Measurements (continued).	Wing	Tail	Bill from feathers of forehd.
l. (Tring Mus.) [♂] ad., Tagulandang, Aug. 1894 (Nat. Coll.)	171	—	15
m. (Tring Mus.) [♂] ad., Tagulandang, Aug. 1894 (Nat. Coll.)	165	—	15
n. (Tring Mus.) [♂] ad., Tagulandang, Aug. 1894 (Nat. Coll.)	161	—	—
o. (C 13463) [♂] ad., Ruang, Aug. 1894 (Nat. Coll.)	173	195	16
p. (C 13465) [♂] ad., Ruang, Aug. 1894 (Nat. Coll.)	163	190	16
q. (Tring Mus.) [♂] ad., Ruang, Aug. 1894 (Nat. Coll.)	166	—	16
r. (C 12647) [♂] ad., Siao, 1. VII. 93 (Nat. Coll.)	172	—	13.5
s. (C 12648) [♂] ad., Siao, 6. VII. 93 (Nat. Coll.)	170	195	15.5
t. (C 12663) [♂] ad., Great Sangi, 27. VII. 93 (Nat. Coll.)	184	210	—
u. (W. Blas. *fIV*) [♂] ad., Great Sangi, 31. VI. 96 (Platen)	174	194	15
v. (W. Blas. *fIV*) [♂] ad., Great Sangi, 11. VIII. 86 (Platen)	170	194	17
w. (Nr. 13426) [♂] ad., Great Sangi (Meyer)	180	215	—
x. (W. Blas. *fIV*) [♀] ad., Great Sangi, 7. VII. 86 (Platen)	180	216	16
y. (C 12649) [♀] ad., Siao, June 1893 (Nat. Coll.)	168	190	—
z. (C 13466) [♀] Biarro, 3. Sept. 1894 (Nat. Coll.)	163	185	15.5
a'. (C 12116) [♀] ad., Banka, May 1893 (Nat. Coll.)	154	185	14
b'. (C 14741) [♂] ad., Banggai, V.—VIII. 95 (Nat. Coll.)	160	180	13.5
c'. (C 14615) [♂] ad., Peling, V.—VIII. 95 (Nat. Coll.)	164	190	14

The tarsus measures from about 18.5 mm (small Banka example) to 23 (large Sangi example). Adult males have the wing varying from 154 mm in the Minahassa to 184 mm in Great Sangi, but between these extremes every intermediate condition is found.

Skeleton (Meyer *a XIV*).

Length of cranium	41.5 mm	Length of tarso-metatarsus	21.5 mm
Greatest breadth of cranium	16.3 »	Length of digitus III	26.5 »
Length of humerus	34.8 »	Length of sternum	44.5 »
Length of ulna	41.3 »	Greatest breadth of sternum	28.0 »
Length of radius	38.7 »	Height of crista sterni	18.0 »
Length of manus	46.3 »	Length of coracoideum	27.6 »
Length of metacarpus	23.0 »	Length of scapula	33.5 »
Length of digitus principalis	22.4 »	Length of clavicula	26.5 »
Length of femur	31.0 »	Length of pelvis	43.5 »
Length of tibia	40.4 »	Greatest breadth of pelvis	27.0 »
Length of fibula	27.0 »		

Eggs. "Near Rurukan in the Minahassa Dr. Platen collected several eggs of this bird, which instead of being pure white, like the white eggs of Pigeons, are cream-yellow, and measure 30 × 22.5 mm" (Nehrkorn MS.). An egg in the Sarasin Collection answers to this description.

Nest. A true Pigeon's nest, but somewhat thick; a thin substructure of roots overlaid with the black fibres of a Palm: diameter c. 150 mm (Tomohon, Minahassa, 22. IV. 94: P.& F. Sarasin).

Breeding season. The Drs. Sarasin obtained two unfledged young (cf. *antea*) from the above nest, in April, and an egg as late as 27th September.

This "Cuckoo-dove", as Indian ornithologists call the species of the genus *Macropygia*, conforms to the rule in being larger in Sangi than on the mainland of

Celebes, whereas in Sula it is considered by Major Wardlaw Ramsay and Salvadori to be smaller. *Spilornis rufipectus* and *Turacoena manadensis* are also reduced in size in Sula. *M. albicapilla* is very similar to *M. amboinensis* (L.) of the Moluccas (Ceram group), which Salvadori *(a 7)* distinguishes by its having the forehead reddish and not whity-grey, the crown and occiput vinaceous and not grey, the hind neck more decidedly green, less golden and less glossed with purple, and the under tail-coverts of a cinnamon-rufous colour more intense and uniform. *M. keyensis* Salvad., *M. maforensis* Salvad., of Kei and Mafoor, respectively, and *M. doreya* Bp. of New Guinea and some of the neighbouring N. W. Islands are also forms nearly related to *M. albicapilla*. *M. macassariensis* Wall. of South Celebes (not known from the North) may be distinguished, as Major Ramsay shows, by its mouse-brown upper surface and the absence in the male of metallic colours, the sexes being presumably similar; also it is much larger.

M. albicapilla contrasts with the other Pigeons of Celebes in having the sexes dissimilar, and a third plumage, much resembling that of the female, for the young. Also, although some allowance must be made for differences in age, it is unquestionably subject to much individual variation, while the other Pigeons seem to be very stable. The genus *Macropygia* seems to mark a low type of Pigeon; in Celebes it seems to be regarded as a sort of Cuckoo.

Dr. Platen *(a 11)* remarks that *M. albicapilla* is the only Pigeon that ventures to approach human settlements, where it is always to be seen in pairs. Major Wardlaw Ramsay writes that the members of the genus are "very partial to open glades and clearings in dense forest, especially when covered with a secondary growth of low scrubby jungle . . . Their food is composed of seeds and berries, one very favourite fruit being the Chilli (*Capsicum fastigiatum*), of which they consume an enormous quantity".

* 277. MACROPYGIA MACASSARIENSIS (Wall.).

Southern Cuckoo-dove.

a. **Macropygia amboinensis** var. **macassariensis** *(1)* Wall., Ibis 1865, 389.

Macropygia macassariensis *(1)* Wald., Tr. Z. S. 1872, VIII, 85; *(2)* Wardl. Rams., Ibis 1890, 240; *(3)* Salvad., Cat. B. XXI, 1893, 343; *(4)* Büttik., Zool. Erg. Weber's Reise in Ost-Ind. III, 1893, 287; *(5)* Hart., Nov. Zool. 1896, 180.

b. **Macropygia albicapilla,** part. *(1)* Meyer, Ibis 1879, 137; *(2)* ? Guillem., P. Z. S. 1885, 558 (specim. e. f.); *(3)* W. Blas., Ztschr. ges. Orn. 1886, 133, 179.

For further references cf. Salvadori *3.*

Descriptions. Wardl. Ramsay *2*, Salvadori *3*, Büttikofer *4.*

Adult. Above bistre-brown, with a chestnut shade on the wing-coverts, greyer brown on head, neck and mantle, the neck and mantle minutely freckled with pale buff; sides of head grey-brown, whitish on chin and throat; remaining under parts buff, barred with brown, almost clear of bars on the lower abdomen and crissum; inner under wing-coverts, and axillaries cinnamon-rufous, inner edges of remiges below washed with the same; tail broccoli-brown, tip whitish, the outermost pair of rectrices

with an obscure dark oblique band on the inner web (Djampea, Dec. 1895: Everett — C 14859).

Sexes. Similar: "the wing of the female is about 5 to 10 mm shorter" (Hartert).

Young. Differs from the adult in having the feathers of the head broadly tipped with cinnamon-rufous, the bases black; the wing-coverts, scapulars and remiges terminally margined with rufous (♀, Djampea, Dec. 1894: Everett — C 14860).

Measurements. Wing 180—192 mm; tail 188—207; tarsus 23; bill 19 (Büttikofer).

The above-described two specimens from Djampea have the wing 200 and 194 mm, and seem, therefore, to belong to a large insular race.

Distribution. South Celebes: Macassar Distr. (Wallace *a 1*, *3*, Teijsmann *4*); Saleyer Id. (Weber *4*, Everett *5*); Djampea (Everett *5*).

There is no evidence to show that this species has ever occurred in North Celebes, where young and female specimens of *M. albicapilla* have been mistaken for it. In South Celebes both species occur together, but the present bird is, as Mr. Büttikofer shows, much larger than *the typical M. albicapilla*, and it is further distinguishable by the mouse-brown colour of its upper surface. Also the sexes seem to be similar in coloration. From the two latter characters Major Wardlaw Ramsay places it with *M. magna* Wall. of Timor and *M. timorlaoensis* Meyer in a separate division of the genus *Macropygia*. The two latter species may, as shown by Count Salvadori's key, be distinguished from the Celebesian bird by their having the head of a different colour from the upper surface. It is said to be mouse-brown uniform with the upper parts in *M. macassariensis*, but this is not absolutely correct, judging from the Djampea birds, which have the head and neck much greyer brown than the other upper parts.

M. macassariensis follows the rule that, when Timorese types occur in Celebes, it is in the South of the island, and sometimes, but not always, in the North as well.

Reinwardtoenas reinwardti (Temm.). The type of this species, which ranges from the Moluccas to New Guinea, was said to have come from Celebes. No proof of this has since been obtained, and Temminck's indication should, therefore, be regarded as erroneous.

FAMILY PERISTERIDAE.

The Turtle-doves and Ground-doves are separated by Count Salvadori as a family consisting of 7 subfamilies. The tarsus is naked (except quite at the joint in *Turtur*, *Geophaps*, and others), and is equal to or longer than the middle toe without the claw; tail-feathers 12—20. Of Salvadori's 7 subfamilies, 2 belong to the New World; the other 5 have representatives in Celebes.

GENUS TURTUR Selby.

Plumage chiefly brown and grey. Tail of 12 feathers, rounded or graduated. Wing moderate, primaries fairly normal in shape. Bill delicate, shorter than the cranium.

The Celebes species belongs to the subgenus *Spilopelia*, in which the feathers of the black cervical collar are bifid, the double tip being white.

Turtur is an old World genus; *Spilopelia* is found from Afghanistan, Yarkand and the Himalayas east as far as China, and south to the Moluccas.

278. TURTUR TIGRINUS (Temm. Kn.).

Barbary Dove.

a. **Columba tigrina** *(1)* Temm. & Knip, Pig. I, 1808—11, pl. 43; *(2)* Schl., Handl. Dierk. 1857, 404.

b. **Turtur chinensis** *(1)* Wall. (nec Scop.), Ibis 1860, 147.

Turtur tigrinus *(1)* Blyth, J. A. S. B. 1855, XXIV, 263, 480; *(II)* Rchb., Tauben 1862, 72, 174, t. 246, figs. 1361—62; *(3)* Ball, Str. F. 1873, I, 80; *(4)* Schl., Mus. P.-B., Columbae, 1873, 127; *(5)* Brüggem., Abh. Ver. Bremen 1876, V, 87; *(6)* Rosenb., Malay. Archip. 1878, 275; *(7)* Legge, B. Ceylon 1880, 706; *(8)* Hume, Str. F. IX, 1880, 258; *(9)* Kelh., Ibis 1881, 528; *(10)* Bock, Ibis 1882, 475; *(11)* A. Müll., J. f. O. 1882, 431; *(12)* Oates, B. Br. Burmah 1883, II, 290; *(13)* Vorderm., N. T. Ned. Ind. 1884, XLIV, 228; *(14)* Hume, Str. F. 1888, XI, 299; *(15)* Hartert, J. f. O. 1889, 347, 376; *(16)* Hickson, Nat. in N. Celebes 1889, 94; *(17)* Hagen, T. Ned. Aard. Genoots. 1890 (2) VII, 156; *(18)* Oates ed. Hume's Nests & Eggs Ind. B. 1890, II, 356; *(19)* Hose, Ibis 1893, 420; *(20)* Salvad., Cat. B. XXI, 1893, 440; *(21)* Everett, Ibis 1895, 32; *(22)* Vorderm., N. T. Ned. Ind. 1895, LIV, 351; *(23)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 15; *(24)* iid., ib. 1896, Nr. 1, p. 14; *(25)* Hart., Nov. Zool. 1896, 163, 554, 564, 573, 589, 598; *(26)* id., ib. 1897, 165.

c. **Metriopelia inornata** (Gray), *(1)* Bp., Consp. II, 1854, 76.

d. **Turtur tigrina** *(1)* Wall., P. Z. S. 1863, 486; *(2)* id., Ibis 1865, 391, 399; *(3)* Wald., Tr. Z. S. VIII, 1872, 85; *(4)* Hume, Str. F. 1874, II, 269; *(5)* id., ib. 1875, III, 164; *(6)* Armstr., ib. 1876, IV, 337; *(7)* Hume, t. c. 424, note; *(8)* Hume & Davison, Str. F. 1878, VI, 442; *(9)* Meyer, Ibis 1879, 137; *(10)* Everett, J. Str. Br. R. A. S. 1889, 193; *(11)* Whitehd., Ibis 1890, 57.

e. **Spilopelia tigrina** *(1)* Sundev., Tentamen 1872, 100; *(2)* Salvad., Cat. Ucc. Borneo 1874, 296; *(3)* id., Ann. Mus. Civ. Gen. 1875, VII, 673; *(4)* Meyer, Verh. z.-b. Ges. Wien 1881, 766, 769, 772; *(5)* Salvad., Orn. Pap. 1882, III, 151; *(6)* W. Blas., J. f. O. 1883 139; *(7)* Meyer, Ztschr. ges. Orn. 1884, 194, 215; *(7bis)* id., Isis, Dresden 1884, 52; *(8)* W. Blas., Z. g. O. 1885, 310; *(9)* Guillem., P. Z. S. 1885, 510, 558; *(10)* Platen, Gefied. Welt 1887, 205; *(11)* Büttik., Notes Leyd. Mus. 1887, IX, 76; *(12)* Vorderm., N. T. Ned. Ind. 1890, L, 508; *(13)* id., Notes Leyd. Mus. 1891, XIII, 129; *(14)* Salvad., Agg. Orn. Pap. 1891, 189; *(15)* id., Ann. Mus. Civ. Gen. 1891, (2) XII, 35; *(16)* Büttik., Zool. Erg. Weber's Reise in Ost-Ind. 1893, III, 305; *(17)* Vorderm., N. T. Ned. Ind. 1893, LII, 203.

"Terkuku", Malay and Alfurous, Minahassa, Meyer *d 9*, Guillem. *e 9*, Nat. Coll.

"Tarkuku", Minahassa, Biarro, Tagulandang, Siao, Nat. Coll.

"Burong kuku", Talissi, Hickson *16*.

"Buluhuo" [? Gorontalo Distr.], Rosenberg *6*.

"Bukuru busar", Tjamba Distr., Platen *e 8*.

For further synonymy and references cf. Salvadori *20*.

Figures and descriptions. Knip *a I*; Reichenbach *II*; Wallace *d 2*; Legge 7; Salvadori *e 5, 20*; Oates *12*; Vorderman *13*.

Adult male. General colour above deep drab, the back and wing-coverts with paler margins, the wing-coverts and inner secondaries with broad blackish mesial streaks, the back and upper tail-coverts with finer streaks; carpus and outermost wing-coverts cinereous with dark streaks; winglet and primary-coverts black, remiges blackish brown; feathers of hind neck bifid, black, tipped with white, or, next the mantle, with pale brown; head and nape vinous-grey, forehead and cheeks pure deep cinereous, chin whitish; narrow rictal streak black; throat and breast deep vinous-grey, becoming on abdomen washed with buff; under tail-coverts white (rarely, as in this specimen, with a small dusky spot on a few at the tip of the shaft), metacarpal edge and axillaries cinereous, the inner under wing-coverts black; the two middle tail-feathers brown like the back, the remaining five pairs black, the three outermost broadly tipped with white (c. 35 mm), becoming narrower and changing to dusky grey on the two next: iris brown (Guillemard *e 9*) or light red (Platen *e 8*); bill brown-black *(e 9)* or black *(e 8)*; feet pinkish *(e 9)* or cherry-red *(e 8)*; (♂ ad., Tomohon, 13. III. 94: P. & F. Sarasin; and others).

Female. Similar to the male, only slightly smaller (Salvad. *20*); fore-neck and breast not so richly tinged with vinaceous; head above browner (♀, Kema, early in Sept. 1893: P. & F. Sarasin).

Young. Without the cervical collar of bifid, white-tipped black feathers; hind neck greyish brown, some of the feathers slightly bifid with dusky bases; the wing-coverts and scapulars terminally edged with whitish or cinnamon; under-parts more buff-tinted (Siao, 4. VII. 93 — C 12645; Banka 14. V. 93 — C 12301: Nat. Coll.).

Fledgling. Two squabs about half-grown, which appear to be correctly determined as the young of *T. tigrinus*, have most of the feathers in brownish leaden sheaths, the sprouted ends of the remiges brown; primaries 10, the distal 10th primary-covert well developed, but no trace (so far as we can make out) of an 11th primary; rectrices 12, the longest (the 3rd pair from the middle) 25 mm; the two outermost pairs pure white, the next mostly white, leaden towards base, the three inner pairs dark leaden, the middle pair shorter than the 2nd, 3rd and 4th. The middle pair and the 4th are set on a higher plane than the remaining 2nd and 3rd, and 5th and 6th pairs (Kema, 14. Sept. 1893: P. & F. Sarasin).

Measurements. Wing 151 mm; tail ca. 150, tarsus 26; bill from feathers of forehead 15.

Eggs. Two, white, moderately elongated ovals, with a very fine shell and some gloss; c. 30 × 22 mm (Hume *18*).

Nest. Flimsily built of fine twigs, usually in thick bamboo-brakes at 10—20 feet, often in a thick jujube tree (Lower Pegu — Oates *18*), or in a bush.

Breeding season. The above-described fledglings from the Minahassa were taken by the Drs. Sarasin on the 14th of September, 1893 in Kema. Mr. Oates remarks that it seems to breed at all times of the year in Pegu.

Distribution. N.E. Cachar (Inglis *8*); Burmah (Oates *12*); Nicobars (Lewis *d 4*); Tenasserim (Briggs *e 5*, Davison *d 8*, *20* etc.); Cochin China (St. Pierre *20*); Siam (Schomburgk *e 5*); Malay Peninsula (Cantor *20*, Wallace *d 2*, etc.); Sumatra (Davison

20, Klaesi *e 11*, Modigliani *e 15*); Banka (v. den Bossche *4*); Billiton (Vorderman *17*); Borneo (Mottley, etc. *d 10*); Balabac (Everett *21*); Palawan (Whitehead *d 11*, *d 10*); Sangi Islands — Siao, Tagulandang, Ruang, and Biarro (Nat. Coll. in Dresd. and Tring Museums); Celebes — Talissi (Hickson *16*), Banka, Mantehage, and Manado tua (Nat. Coll.), Minahassa (Wallace *b 1*, *20*, Meyer *d 9*, etc.), Gorontalo Distr. (v. Rosenberg *4*, Meyer *d 9*), West Celebes, Dongala (Doherty *26*), Central Celebes, Barau (Sarasins *24*), Tjamba Distr. (Platen *e 8*), Macassar (Wallace *20*); Indrulaman (Everett *25*); Java (Horsfield *e 5*, Bernstein *4*, etc.); Kangean Is. (Vorderman *e 17*); Bali (Doherty *25*); Lombok (Wallace *d 1*, *20*, etc.); Sumbawa (Forsten *4*, Guillemard *e 9*, etc.); Sumba (Riedel *e 4*, Doherty *25*); Flores (Wallace *d 1*, *20*, Semmelink *4*, Weber *e 16*); Solor (Wallace *20*); Timor (Wallace *d 1*, *20*, Hoedt *4*); Wetter (Hoedt *4*, Riedel *e 4*); Kisser, and Lettie (Hoedt *4*); Daweloor (Riedel *e 4*); Timorlaut (Riedel *e 7*); Halmahera (Bernstein *4*, Bruijn *e 5*); Ternate (Wallace *d 2*, *20*, Bernstein *4*); Tidore (Bruijn *e 5*); Amboina (S. Müller *4*).

In the Catalogue of Birds vol. XXI, Count Salvadori divides the Turtle Doves into five subgenera, one of which, *Spilopelia* Sundev., is constituted by the present species and its two relations, *T. chinensis* (Scop.) of China and *T. suratensis* (Gm.) of India, Ceylon and Afganistan. They are recognisable by the feathers of the hind neck, which are bifid and black, with the double tip white. *T. chinensis* is larger than *tigrinus*, has the under tail-coverts grey, not white, and wants the dark shaft-streaks on the wings and scapulars; *T. suratensis* has two reddish side-spots at the tips of the feathers of the upper back and scapulars, and "the wing-coverts and tertials with a terminal black spot spreading up the shaft and set off by an isabelline or greyish red spot on each side" (Legge *7*). Mr. Hume *(d 5)* believed that *T. suratensis* and *tigrinus* intergraded with one another in Upper Pegu, but this view has found confirmation neither from A. Müller *(11)*, Oates *(12)*, nor Salvadori *(e 5, 20)*, and later Hume himself seems to have abandoned it *(14)*.

According to Meyer *(d 9)* *T. tigrinus* was introduced into Celebes about the year 1835, and it is now a common species at least in the North of the island. In a similar way it was introduced into Labuan by Mr. Low, as Mr. Everett *(d 10)* states, and it now abounds there, and the author adds that "it is said to have been introduced on the mainland of Borneo from Java". It is kept in cages and much loved as a pet in Sumatra, according to Bock *(10)* and Hagen *(17)*, and in the Malay Peninsula (Kelham *9*); in the former country it is, as Bock says, regarded as something almost sacred, and absurdly high prices (as Davison also found) are demanded for specimens, but Hagen seems to have found that they are treated with less reverence in East Sumatra, the males being kept for fighting purposes. The custom of keeping it in cages may explain its introduction into many localities, but it would appear to have spread its range by flight as well. Its original habitat appears to have been the Burmese countries or Java.

Birds found from Java to Timor are said by Count Salvadori to be rather

larger than others, and Dr. Guillemard found the iris of Sumbawan examples to be yellow and that of ones from North Celebes to be brown, but it must be pointed out that Dr. Platen's birds from South Celebes are recorded as having a light red iris *(e 8)*. It is not clear why Salvadori suspects that this bird is only a winter migrant to Timor and the Moluccas; we can find no evidence of any such seasonal movement, and the existence of local differences is not in favour of it. In Celebes the bird breeds, and we have specimens dated January and March to September; as to winter movements here, if there are any, we know nothing.

Meyer observed this Turtle Dove everywhere in the Minahassa near the roads, on the sea-shore, and in the mountains. Davison *(d 8)*, writing from Tenasserim, describes it as resorting to gardens, fields, grassy land; "in fact wherever the country is open; sometimes singly, sometimes in pairs, sometimes in small flocks, sometimes in hundreds". It feeds on seeds, rice, and such like. The habits of its near relative *T. suratensis* are interestingly described by Col. Legge in the "Birds of Ceylon", and no doubt are largely those of *Turtur tigrinus* also.

GENUS GEOPELIA Sw.

The genus *Geopelia* contains some of the smallest Pigeons. The tail is formed of 14 feathers, strongly graduated, as long as the wing or longer; the terminal third of the outermost primary is much attenuated. The chief colours are brown, grey, and vinaceous, and, except in one species *G. cuneata* (Lath.), the upper surface is barred with black. The genus is found from Burma to Australia.

Besides *Geopelia* Count Salvadori includes in his subfamily *Geopeliinae* the American forms *Scardafella* and *Gymnopelia*, but these have 12 rectrices and the first primary not attenuated.

279. GEOPELIA STRIATA (L.).

Barred Dove.

a. **Transverse striped or Barred Dove** *(I)* Edw., Birds 1750, I, pl. 16.

b. **Columba striata** *(1)* Linn., S. N. 1766, I, 282 (ex Brisson); *(II)* Thienem., Fortpflanz. 1846, 60, t. XI, f. 10 (egg).

c. **Columba malaccensis** *(1)* Gm., Syst. Nat. 1788, II, 788; *(II)* Temm. & Knip, Pigeons I, 1808—11, pl. 47.

d. **Columba bantamensis** *(I)* Sparrm., Mus. Carls. 1788, III, t. 57.

Geopelia striata *(1)* Gray, List Gen. B. 1840, 58; *(2)* id., Gen. B. II, 471 (1844); *(III)* Rchb., Columbariae 1847, t. CLV, figs. 1385—86; text (1862) 26, 194; *(4)* Bp., Consp. II, 1854, 94; *(5)* E. Newt., Ibis 1861, 116, 182, 274; *(6)* Wall., Ibis 1865, 394; *(7)* Sclat., P. Z. S. 1869, 627; *(8)* Wald., Tr. Z. S. 1872, VIII, 86; *(9)* Schl., Mus. P.-B., Col., 1873, 131; *(10)* Salvad., Cat. Ucc. Borneo 1874, 298; *(11)* Hartl., Vög. Madag. 1877, 404; *(12)* Tweedd., P. Z. S. 1877, 700; *(13)* Hume & Davis. Str. F.

1878, VI, 423; *(14)* Oust., Bull. Soc. Philom. 1878, 180; *(15)* Meyer, Ibis 1879, 138; *(16)* Milne-Edw. & Grandid., Ois. Madag. 1879, 469; *(17)* Nichol., Ibis 1881, 155; *(17bis)* Kelh., t. c. 528; *(18)* Meyer, Verh. z.-b. Ges. Wien 1881, 772; *(19)* Salvad., Orn. Pap. III, 1882, 155; *(20)* A. Müll., J. f. O. 1882, 431; *(21)* Oates, B. Br. Burmah 1883, II, 298; *(22)* Shell., Ibis 1883, 330; *(23)* Vorderm., N. T. Ned. Ind. XLIV, 1884, 229; *(24)* Büttik., Notes Leyd. Mus. 1887, IX, 77; *(25)* Hartert, J. f. O. 1889, 376, 406; *(26)* Everett, J. Str. Br. R. A. S. 1889, 194; *(27)* Hagen, T. Ned. Aard. Genoots. 1890, (2) VII, 159; *(28)* Steere, List Coll. B. & M. Philipp. Is. 1890, 24; *(29)* Salvad., Agg. Orn. Pap. 1891, 189; *(30)* Hartert, Ornis 1891, 122: *(31)* id., J. f. O. 1891, 300; *(32)* Vorderm., N. T. Ned. Ind. 1893, LII 204; *(33)* Salvad., Cat. B. XXI, 1893, 458; *(34)* Büttik., Zool. Erg. Weber's Reise Ost-Ind. 1893, III, 281; *(35)* Grant, Ibis 1894, 411; *(36)* Hartert, Novit. Zool. 1894, 482; *(37)* Vord., N. T. Ned. Ind. 1895, LIV, 351; *(38)* Grant, Ibis 1895, 471; *(39)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 14; *(40)* Hart., Nov. Zool. 1896, 164, 554, 598.

e. **Turtur malaccensis** *(1)* Schl. & Pollen, Faun. Madag. 1868, 155.

f. **"Perkoetoet"**, Saleyer, *(1)* Engelhard, Bijdr. taal, land, volkenk. Ned. Ind. 4 ser. VIII, 1884, 281.

"Bukuru kidjill", Tjamba Distr., Platen in Dresd. Mus.

For further synonymy and references cf. Salvadori *33*.

Figures and descriptions. Knip *c II*; Reichenbach *III*; Bonaparte *4*; Hartlaub *12*; Hume *13*; Milne-Edw. & Grandidier *16*; Salvadori *19*, *33*; Oates *21*.

Adult male. Above drab, the wing-coverts and feathers of back with a terminal black bar, narrower on rump and tip of upper tail-coverts; sinciput, cheeks and throat cinereous, hind head and nape pale reddish brown; neck white, browner behind, each feather crossed with two or more bars of blackish brown; jugulum and middle of breast pale vinous, becoming on abdomen and under tail-coverts buffy white; sides of breast and of body white, barred with dark brown like the neck, more fulvous on sides of body; under wing-coverts dark cinnamon with dark bars; remiges where they rest upon the body dark cinnamon, the rest of them below dusky drab, end of first primary (10th from carpus) attenuated for c. 2 cm; tail, 14 feathers, above dusky drab, the five outer pairs tipped with white, increasing in width to the outermost, the basal part of the feathers black or blackish; "iris light blue, bill and periocular skin lead-grey; feet reddish grey; length 210 mm; expanse 360 mm": wing 105 mm, tail c. 110, tarsus 21, bill from feathers of forehead 13 (♂, Kalibangkere, S. Cel., 1. V. 78: Platen — Nr. 13880).

Female. "Similar to the male, but smaller and less reddish on the occiput" (Salvad. *33*).

Young. "A nestling has the entire crown, occiput, nape and upper parts closely barred pale rufescent and brown; and the entire breast and upper abdomen similarly barred, but with the vinous tinge already apparent on the middle of the breast; almost the entire wing-lining is pale chestnut" (Hume *13*).

Eggs. "Size 22—24 × 16—17 mm" (Nehrkorn MS.), 2 in number, white.

Nest. On the top of a large tuft of grass laid by the wind, somewhat large and neatly put together for a Dove (Mauritius — E. Newton *5*).

Breeding season. An egg from Salanga was dated 12th May (A. Müller *20*); probably the bird breeds during most of the year.

Distribution. South Tenasserim (Davison *13*, *21*); Siam (Schomburgk *33*); Malay Peninsula (Sonnerat *19*, Blyth *19*, etc. *33*); Singapore (Davison *33*, Kelham *17bis*); Sumatra (Raffles *19*, Bock *33*, Hartert *25*, etc.); Sirhassen (Everett *36*); Banka (v. d. Bossche *9*); Billiton (Brit. Mus. *33*); Borneo (Schwaner *9*, *26*, Treacher,

Ussher *26*); Luzon (Everett *12*, Steere *28*, Whitehead *35*); South Celebes — Macassar (Wallace *8*, Meyer *15*, Weber *34*, etc.), Maros and Segeri (Meyer *15*), Tjamba Distr. (Platen in Dresd. Mus.), Pare-Pare (Weber *34*); Saleyer Id. (Engelhardt *f 1*); Java (Horsfield *19*, etc.); Madura (Meyer *33*); Kangean Island (Vorderman *32*); Bali (Doherty *40*); Lombok (Wallace *6*, *33*, Everett *40*); Daweloor near Babbar (Riedel *18*), Babbar (Riedel *18*); Amboina (S. Müller *19*).

Introduced into: Madagascar (Hartlaub, etc. *11*, *16*, *22*); Bourbon (Hartlaub *11*, *22*); Mauritius (E. Newton *5*, *11*, *22*); Round Island *(22)*; Seychelles (E. Newton *11*, Lantz *14*); St. Helena (Shelley *22*, *33*).

The Barred Ground-dove is very common in flocks on the fields in South Celebes; in the North of the island it is unknown. This is commonly the case with Lesser Sunda forms occurring in Celebes. The Sarasins received nestlings from near Allu on the south coast on 1st Sept., 1895. In its habits it is said by Davison to resemble *Turtur tigrinus* to some extent; it frequents cultivated ground, feeding upon seeds on the ground. Like *T. tigrinus* it is much esteemed as a pet by the Malays; it readily becomes domesticated, and evinces much affection for its owner. It has been recorded as having bred in the gardens of the Zoological Society of London. In Madagascar, the Mascarene Islands, and St. Helena, where it has been introduced, it now occurs very plentifully as a wild species.

There are five species of the genus *Geopelia* found from Australia to Tenasserim; three of these are peculiar to Australia, except that one occurs in S. New Guinea as well. *G. striata* stands nearest to *G. maugei* (Temm.) of the Lesser Sunda Islands and Timorlaut, and to *G. tranquilla* Gld. of Australia. *G. maugei* may be recognised by its having all the breast barred, without a vinous space on the middle and on the jugulum, the wing below is almost entirely cinnamon-rufous or light chestnut. *Geopelia tranquilla* also wants the vinous space on the breast, it has no bars on the sides, and the back is greyer. Mr. Hume shows (see *supra*) that the nestling wants the vinous on the breast, which is entirely barred, and in this and in its having the entire wing-lining pale chestnut it suggests the plumage of *G. maugei*. *G. striata* may well be a more recent development, since the genus becomes more strongly represented in the direction of Australia and would seem to have originated there.

GENUS CHALCOPHAPS J. Gd.

In these Ground-doves the tarsus is not scutellated in front, except on its lower part; the tail is composed of 12 feathers, is much shorter than the wing and nearly square; the primaries are of normal shape — not appreciably scooped out or attenuated, the upper wing-coverts glossy bronze-green in colour; the bill is rather slender and about as long as the cranium. The genus, which belongs to Salvadori's subfamily *Phabinae*, ranges from India to Australia and the New Hebrides.

280. CHALCOPHAPS INDICA (L.).

Bronze-winged Dove.

a. **Green-winged Dove** *(I)* Edw., Birds 1741, I, pl. 14.

b. **Columba indica** *(1)* Linn., S. N. 1766, I, 284 (ex Edw.); *(II)* Hayes, Portr. of rare and cur. B. II, pl. 79 (1799).

c. **Columba javanica** *(1)* Gm., S. N. 1788, I, 781 (ex D'Aubent.).

Chalcophaps indica *(1)* Gray, List Gallinae Br. Mus. 1844, 18; *(2)* id., Gen. B. II, 477 (1845); *(3)* Bp., Consp. II, 1854, 91; *(4)* Hartl., J. f. O. 1854, 158; *(5)* Moore, P. Z. S. 1859, 467; *(VI)* Rchb., Tauben 1862, 46, 166, t. 260, fig. 1441—42; *(7)* Swinh., Ibis 1864, 420, 421; *(8)* id., ib. 1865, 357; *(9)* Schl., Ned. Tdschr. Dierk. 1866, III, 265, 266; *(10)* Blyth, Ibis 1866, 221; *(11)* id., ib. 151; *(12)* Swinh., P. Z. S. 1871, 397; *(13)* Holdsw., P. Z. S. 1872, 467; *(14)* Wald., Tr. Z. S. VIII, 1872, 86, 114; *(15)* Schl., Mus. P.-B. 1873, 145; *(16)* Legge, Ibis 1874, 26; *(16bis)* Salvad., Cat. Ucc. Born. 1874, 299; *(17)* Hume, Str. F. 1874, II, 70, 75, 80, 269; *(18)* Ball., t. c. 425; *(19)* Hume & Bourd., Str. F. 1876, IV, 404; *(20)* Hume & Inglis, Str. F. 1877, V, 40; *(XXI)* Rowl., Orn. Misc. II, 119, pl. 51 (1877); *(22)* David & Oust., Ois. Chine 1877, 384; *(23)* Tweedd., P. Z. S. 1877, 700, 765, 833; *(24)* id., ib. 1878, 953; *(25)* Hume & Davison, Str. F. 1878, VI, 424; *(26)* Tweedd., P. Z. S. 1879, 73; *(27)* Sharpe & Burbidge, t. c. 346; *(28)* Meyer, Ibis 1879, 138, 146; *(29)* Legge, B. Ceylon 1880, 714; *(30)* Reid, Str. F. 1880, IX, 500; *(31)* Kelh., Ibis 1881, 528; *(31bis)* Wardl. Rams., Tweedd. Orn. Works 1881, 659, Nr. 290; *(32)* Salvad., Orn. Pap. III, 1882, 173; *(33)* W. Blas., J. f. O. 1883, 162; *(34)* Vorderm., N. T. Ned. Ind. 1883, XLII, 228; *(35)* Oates, B. Br. Burmah 1883, II, 297; *(36)* Davison, Str. F. 1883, X, 408; *(37)* Pleske, Bull. Ac. Petersb. 1884, 132; *(38)* Guillem., P. Z. S. 1885, 416, 510, 558; *(39)* W. Blas., Z. ges. Orn. 1886, 198; *(40)* Salvad., Ann. Mus. Civ. Gen. 1887, (2) XII, 561; *(41)* Hume, Str. F. 1888, XI, 300; *(42)* Lister, P. Z. S. 1888, 522; *(43)* Everett, J. Str. Br. R. A. S. 1889, 194; *(44)* Hartert, J. f. O. 1889, 433; *(45)* Whitehead, Ibis 1890, 56; *(46)* Sh. & Whiteh., t. c. 136; *(47)* Sharpe, t. c. 284; *(48)* W. Blas., J. f. O. 1890, 139; *(49)* Steere, List. Coll. B. & M. Philipp. Is. 1890, 24; *(50)* Hagen, T. Ned. Aard. Genoots 1890, (2) VII, 158; *(51)* Oates ed. Hume's Nests and Eggs Ind. B. 1890, II, 363; *(52)* Salvad., Agg. O. P. 1891, 190; *(53)* Vorderm., Notes Leyd. Mus. 1891, 129; *(54)* id., N. T. Ned. Ind. 1891, L, 508; *(55)* Sharpe, Ibis 1892, 442; *(56)* De La Touche, t. c. 493; *(57)* Salvad., Ann. Mus. Civ. Gen. 1892, (2) XII, 141; *(58)* id., Cat. B. XXI, 1893, 514—520; *(59)* Hose, Ibis 1893, 421; *(60)* Styan, t. c. 435; *(61)* Büttik., Zool. Erg. Weber's Reise Ost-Ind. 1893, III, 305; *(62)* Vorderm., N. T. Ned. Ind. 1893, LII, 204; *(63)* Munn, Ibis 1894, 55; *(64)* Sharpe, t. c. 257; *(65)* Bourns & Worces., B. Menage Exped. 1894, 30; *(66)* Grant, Ibis 1895, 471; *(67)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 15; *(68)* iid., ib. 1895, Nr. 9, p. 8; *(69)* iid., ib. 1896, Nr. 1, p. 14; *(70)* iid., ib. 1896, Nr. 2, p. 20; *(71)* Hart., Nov. Zool. 1896, 163, 554, 564, 574, 590, 598; *(72)* id., ib. 1897, 165.

d. **Chalcophaps indicus** *(1)* Jerd., B. India III, 1864, 484.

e. **Chalcophaps javanica** *(1)* Bp., Consp. II, 1854, 91; *(II)* Rchb., Tauben 1862, 46, 166, Novit., t. I, figs. 8, 9.

f. **Chalcophaps moluccensis** *(1)* Gray, P. Z. S. 1860, 361; *(2)* Wall., P. Z. S. 1862, 345.

Supposed local race of Great Sangi.

g. **Chalcophaps indica** var. **sanghirensis** *(1)* W. Blas., Ornis 1888, 623.
h. **Chalcophaps sanghirensis** *(1)* Salvad., Cat. B. XXI, 1893, 513.

"Momboi tana", "Pombo tana", Minahassa, Nat. Coll.
"Kolohono", Tagulandang, Ruang, and Siao, **"Kohono"**, Great Sangi, iid.
"Limukon", Tonkean, E. Celebes, iid.
"Sebot", Peling, iid.

For further synonymy and references cf. Salvadori *58*, and for Great Sangi, W. Blasius *g 1*.
Figures and descriptions. Rowley *XXI*; Hayes *b II*; Reichenbach *VI, e II*; Bonaparte *3, e 1*; Jerdon *d 1*; David & Oustalet *22*; Legge *29*; Salvadori *32*, *58*; Vorderman *34*; Oates *35*.

Adult male. Forehead and a broad superciliary stripe greyish white, changing on occiput and nape to bluish lead-colour; sides of head and under-parts brownish wine-purple, greyer on the abdomen, paler on the chin; hind neck, mantle and lesser wing-coverts darker brownish vinaceous, the feathers margined with purplish lead-colour, the lesser wing-coverts broadly tipped with greyish white, forming a bar; the other wing-coverts, back and inner remiges golden-green, upper back with leaden margins, the remaining remiges and winglet dark brown; the lower back chocolate, glossed with bronze, and crossed with two bands of bluish grey; feathers of rump, and upper tail-coverts blackish, with bluish grey bars; under tail-coverts slaty, the longer ones and tail dusky black, the 3 or 4 lateral pairs of tail-feathers grey at the base and terminal margin; under wing-coverts and remiges below where they rest upon the body dark cinnamon-rufous, the rest of the remiges dusky brown; "iris blackish brown; feet cherry-red; claws light grey; bill fiery red" — Meyer 28 ([♂] near Manado, Aug.—Sept. 1892: Nat. Coll. — C 10934).

Female. Differs from the male in having the head above vinaceous rufous brown like the neck and breast; the four middle tail-feathers brown, the next two pairs more or less cinnamon-rufous and blackish, the outer pairs as in the male; the greyish white bar on the ulnar coverts hardly indicated (near Manado, Aug.—Sept. 1892: Nat. Coll. — C 10935).

Young. *Macropygia*-like; dusky brown above, the lesser wing-coverts and scapulars mostly golden-green, the greater and middle wing-coverts tipped with cinnamon-rufous forming two bars; tail much as in the female; under-parts barred with cinnamon and dusky (juv. Lotta, Minahassa, 25. V. 93: Nat. Coll. — C 12134).

Measurements. Wing (adults Celebes) 142—152 mm, (adults Tagulandang, Ruang and Siao) 149—161, (Great Sangi) 142—152; tail ca. 90; tarsus 27; culmen from nasofrontal suture ca. 21.

Eggs. Cream-colour, 27 × 20 mm (Bengal — Nehrkorn MS.). Two in number; cream-white to white with a decided, though very pale, café-au-lait tinge; oval, sometimes rather pointed; shell fine and fairly glossy (Hume *51*).

Nest. Of roots, grass and twigs; saucer-shaped; usually built low down in a dense bush or tree in forest or jungle (Hume *51*).

Distribution. Himalayas west as far as Cashmere; south and east to Hainan and Formosa, Ceylon, the Andamans and Nicobars, through the Malay Peninsula and East India Islands as far as West New Guinea.

For exact recorded localities cf. Salvadori *32*, and add: Cambodia (Mouhot *11*); ? South China (De La Touche *56*); Nias and Engano (Modigl. *40*, *57*); Billiton (Vorderman

53, *54*); Kangean (Vorderman *62*); Tagulandang, Ruang, Talaut, Peling (Nat. Coll. in Dresden and Tring Museums); Sooloo (Platen *48*, *64*).

Celebesian Province: — South Celebes (P. & F. Sarasin *69*, Everett *71*); Minahassa (Meyer *28*, Guillemard *38*); Malibagu in Bolaang Oki Distr. (P. & F. Sarasin); Gorontalo Distr. (Meyer *28*, Riedel *39*); W. Celebes (Doherty *72*); Togian (Meyer *28*); Banka, Mantehage and Manado tua (Nat. Coll.); Tagulandang and Ruang (iid.); Siao (Hoedt *15*, Duivenb. *15*, Nat. Coll.); Great Sangi (Hoedt *15*, Platen *g 1*, Meyer, and Nat. Coll. in Dresden Mus.); Talaut Islands (Nat. Coll. in Dresden and Tring Mus.); Sula Islands: Sula Besi and Sula Mangoli (Allen *f 2*, Bernstein *15*, Hoedt *15*); Peling (Nat. Coll. in Dresd. and Tring Mus. *70*).

The Beetle-wing, as Indian ornithologists sometimes call this Ground-dove, was described over a hundred and fifty years ago by Edwards, who speaks of it as the most beautiful of the Dove-kind in his opinion that he had ever seen. It is very questionable even now whether any before- or since-discovered *Columbine* types can claim to surpass it, beautiful as are, for instance, the Golden Doves (*Chrysoenas*) of Fiji, the Nicobar Pigeon, the Crowned Pigeons of the Papuan Islands and above all *Otidiphaps* from New Guinea. Its voice is as pleasing as its plumage; a passage, quoted by G. D. Rowley *(XXI)* from Sir J. Emerson Tennent, reads: "its soft and melancholy notes as they came from some solitary place in the forest, were the most gentle sounds I ever listened to"; Legge speaks of its cry as "a melodious though deep unpigeon-like coo". As cage-birds they are much appreciated by the Malays, who, by imitating their call-note with a peculiar instrument described by Burbidge *(27)*, lure them to their capture in a sort of wigwam of leafy boughs; they are said to become tame quickly in captivity and have also been imported into European Zoological Gardens. Another good, though less aesthetic, qualification is mentioned by Whitehead *(46)* and Hagen *(50)*, namely, that they are very good eating.

It is not generally known, apparently, that this Pigeon is to some extent a local migrant, or at all events shifts its quarters in some parts according to the season. Thus, in the Travancore Hills, Mr. Bourdillon *(19)* found that it descends to the lower jungles in winter, while in a part of Ceylon Mr. Holdsworth *(13)* observed that it frequents the jungle at the end of the year in great numbers. In some parts of the East Indies the migratory movement is more pronounced; in Labuan and on the opposite coast of Borneo it is, as stated by Mr. Burbidge *(27)* and Mr. Whitehead *(46)*, a summer visitor, arriving with the S. E. Monsoon in April; and Mr. Whitehead also says *(45)* that in Palawan it was very common when he first arrived in the island in June, but by September none were to be met with. In other quarters its range has undergone variation within the memory of man, for Mr. Reid *(30)* was informed by an "old shikaree" that the latter caught them when a boy in the Lucknow division of India, a district where it does not now occur. In Celebes it appears to have become commoner of late years; five and twenty

years ago specimens from there were very rare in collections; Meyer collected a good many, but found it not common and difficult to get; our native collectors appear to have found it not rare in 1892—93, though the proportion of specimens sent is rather under than above the average number for a Pigeon. We have specimens before us dated at intervals from April to December, as well as the young; it is possible, therefore, that the species is stationary in North Celebes. It has only recently *(69, 71)* been recorded from the South of the island.

Prof. W. Blasius has separated the Great Sangi bird as a local variety, and the distinction is admitted by Count Salvadori; but in consequence of the unstationary habits of the species in some parts we entertain some doubts as to the racial distinctness of the Sangi birds, though our only adult male from Great Sangi seems to bear out Prof. W. Blasius' distinctions, being more vinous and less blue on the nape, hind neck and mantle, and with a browner tinge below than nine adult males from Tagulandang, Banka, Mantehage, North Celebes, Halmahera, Ceylon, and India. There is a little vinous at the base of the bill, but this is also seen in one or two Celebesian examples.

Compared with the above Indian and Ceylon examples, the Celebes bird is somewhat darker purplish below, a difference already pointed out by Legge. *C. indica* may be termed a species of the Indian Region, though it ranges east as far as N. W. New Guinea; in other parts of the Australian Region it is represented by *C. chrysochlora* (Wagl.), which is found in the Timor Group, some of the Southern Moluccas and S. E. New Guinea as far as the New Hebrides and South Australia. This bird, which never seems to occur in the same locality with *C. indica*, differs from the latter in wanting the white forehead and superciliary stripe, the whole head, neck and mantle being dark vinous with a leaden tinge on the nape, the white ulnar bar is broader, and the inner webs of the quills much more extensively cinnamon-rufous. Count Salvadori considers the adult male of the Sangi bird intermediate between the two, and it appears possible that the birds may have met on that island and have interbred. On Christmas Island in the Indian Ocean a species, *C. natalis* Lister, occurs, the male of which is similar to that of *C. indica*, but the female has the middle tail-feathers and upper tail-coverts cinnamon. *C. stephani*, which occurs in Celebes, may be recognised by its cinnamon-rufous lower back and rump, crossed by a band of burnt umber; its under surface is dark russet, and the male has a sharply-defined sinciput of white.

The plumage of the young of *Chalcophaps indica* calls to mind, as was remarked by Blyth, that of the genus *Macropygia*, a fact of considerable importance in considering the phylogeny of Pigeons. The case is almost as striking as that of the little slate-and-rufous Hawks of Celebes (*Accipiter* and *Spilospizias*), the young of which are like Kestrels. Most usually the sexes of Pigeons are similar and the young assume the adult plumage at once; *Macropygia* is an exception, and a more striking exception is the present *Chalcophaps*.

281. CHALCOPHAPS STEPHANI Rchb.

Hazel-backed Dove.

a. **Peristere d'Étienne** *(1)* Hombr. & Jacq. Voy. Pôle Sud, Atl. 1846, pl. 28, f. 2.

Chalcophaps stephani *(1)* Rchb., Columbariae, Novit. 1851, t. 259, f. 2595; *(2)* Jacq. & Pucher., Voy. Pôle Sud, Zool. III, 1853, 119; *(3)* Bp., Consp. Av. II, 1854, 92; *(4)* Wall., Ibis 1865, 394; *(5)* Schl., Ned. Tdschr. Dierk. 1866, III, 265, 267, 345; *(6)* Wald., Tr. Z. S. 1872, VIII, 85, 114; *(7)* Schl., Mus. P.-B., Columbae, 1873, 151; *(8)* Brügg., Abh. Ver. Bremen 1876, V, 87; *(9)* Salvad., Ann. Mus. Civ. Gen. 1877, X, 160; *(10)* id., Orn. Pap. III, 1882, 178, 562; *(11)* Finsch, Mitth. Orn. Ver. Wien VIII, 1884, 93; *(12)* Pleske, Bull. Ac. Petersb. 1884, XII, 133; *(13)* W. Blas., Z. ges. Orn. 1886, 137; *(14)* Salvad., Agg. Orn. Pap. 1891, III, 190; *(15)* id., Cat. B. 1893, XXI, 521; *(16)* Meyer, Ibis 1893, 483; *(17)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 2, p. 20; *(18)* Hart., Nov. Zool. 1896, 249, 536; *(19)* id., ib. 1897, 160, 165.

b. **Chalcophaps hombroni** *(1)* Wall., Ibis 1865, 394.

c. **Chalcophaps wallacei** *(1)* Brüggem., Abh. Ver. Bremen 1876, V, 464; *(2)* W. Blas., J. f. O. 1883, 114, 122, 139, 162.

For further synonymy and references cf. Salvadori *15*.

Figures and descriptions. Hombron & Jacquinot *a I*; Reichenbach *I*; Jacquinot & Pucheran *2*; Bonaparte *3*; Schlegel *5*; Salvadori *10*, *15*.

Male adult. A short sinciput white; rest of head, neck and upper mantle glossy magenta-purple on a cinnamon-brown ground; back, lesser wing-coverts, rump, upper tail-coverts and tail chestnut, brighter on the rump; across the lower back two darker bands, with a band of light cinnamon between them; the lateral tail-feathers blackish at the tips and inner webs, the outermost pair grey, with a broad subterminal area of blackish, base of the outer web cinnamon-hazel; tail below (when not spread out) blackish; middle and greater wing-coverts and inner remiges glossy golden-green; the other remiges dusky brown; chin, cheeks, throat and jugulum hazel, glossed with purple; remaining under parts, including under side of wing, more cinnamon-rufous, under tail-coverts darker, chestnut: "iris narrow, dark olive-brown; eyelids dull red; bill bright yellow; feet blood-red" — Wall. *4* ([♂] ad., Gorontalo: Riedel — C 267).

Female. Similar to the male, but the forehead grey, not white; the rest of the head and hind neck hazel without so much magenta-purple gloss ([♀] ad., Celebes: Riedel, Manado, Mch. 71: Meyer — C 2048).

Young. "Brown, varied with cinnamon colour; forehead ashy rufous or whitish rufous; feathers of the upper and under parts brown, tipped with rufous-cinnamon; upper tail-coverts and greater wing-coverts almost entirely cinnamon" (Salvad. *15*).

Measurements (4 adults — N. Celebes): Wing 147—155 mm; tail 102—108; tarsus 26; bill from feathers of forehead 17—18.

Distribution. Celebes: — Gorontalo Distr. (Forsten *7*, Rosenb. *7*, Riedel *13* and Dresd. Museum); Minahassa: Manado (Wallace *4*, *15*, Meyer *6* and Dresd. Mus.); South Celebes (Doherty *19)*; West Celebes (Doherty *19*); East Celebes (Nat. Coll. in Dresden and Tring Mus. *17*); Ternate (Fischer *12*); Waigiou (Wallace *10*, *15*, Bernstein *7*); Batanta (Bruijn, Beccari *10*); Salawatti (Bernstein, Hoedt *7*); Mysol (Wallace *4*, *15*, Hoedt *7*); Kei (Rosenberg *7*, Beccari *10*); Aru (Rosenberg *7*, Beccari *10*, Riedel, Dresd. Mus.); New Guinea (Hombron & Jacquinot

2, etc. *10*, *14*); Tarawai and Jobi (Bruijn *10*); New Britain (Finsch *11*); Duke of York (Brown *15*).

The Solomon Islands harbour a race of this species, *C. mortoni* Rams., of larger size, with a longer white sinciput in the male, or a broader extent of grey here in the female.

In Celebes this bird seems to be very rare. In the Moluccas it is as yet known only from Ternate by a single specimen sent to the St. Petersburg Museum by Fischer. The Celebesian bird was thought by Schlegel, Brüggemann and Wallace to be larger than that of the Papuan Islands, but Salvadori *(10)* and W. Blasius *(13)* have shown that this is not the case. W. Blasius holds with Wallace that the Papuan form has a much more golden, even coppery metallic gloss in the green of the wings; but this difference is not appreciably shown by the Dresden examples, and a more extensive gloss of magenta on the neck and mantle of two adult males from Celebes may point simply to greater age. Most likely *C. stephani* is a recent addition to Celebes.

It is easily distinguishable from its fellow-species in the island, *C. indica*, by its hazel-red back and lesser wing-coverts; by its hazel tail-feathers (except the outermost), blackish in *C. indica*; by the cinnamon bar across its lower back, grey in *C. indica*, by its rufous-brown under surface, and in the male by its sharply defined white sinciput.

GENUS PHLOGOENAS Rchb.

Compared with *Chalcophaps*, *Phlogoenas* may be easily distinguished by its tail of 14 rectrices, by its relatively longer tarsus, which exceeds the length of the middle toe and claw, and by the non-metallic character of the upper wing-coverts, except in some forms about the bend of the wing. The wing is rounded and somewhat short; in the Celebes forms the secondaries fall about 3 cm short of the tip of the wing. They are heavy birds, about the size of a Partridge, and always seem to be rare. *Phlogoenas*, which is included by Count Salvadori in the subfamily *Geotrygoninae*, is found in the East India Archipelago from the Philippines and Wetter to the Solomon Islands, and in Polynesia east as far as Carlshoff Island in the Paumotu Archipelago.

* 282. PHLOGOENAS TRISTIGMATA Bp.

North Celebes Ground-dove.

a. **Columba tristigmata** Temm. in Leyd. Mus.; *(1)* Schl., Handl. Dierk. 1857, 408.

b. **Phlegaenas tristigmata** *(1)* Bp., Consp. II, 1854, 88; *(2)* Wall., Malay Archip. 1869, I, 413 (Likoupang).

c. **Phlegoenas tristigmata** *(1)* Bp., Compt. Rend. XL, 1855, 207, 221, Nr. 263; *(2)* id., Coup d'Oeil Ordre Pig. 1855, 45, 59, Nr. 263; *(3)* Wall., Ibis 1860, 142; *(IV)* id., Ibis 1865, 393, pt. (Manado), pl. IX; *(5)* Schl., Mus. P.-B., Columbae, 1873, 158.

d. **Goura tristigmata** *(1)* Schl., De Dierent. 1864, fig., p. 40.
Phlogoenas tristigmata *(1)* Wald., Tr. Z. S. VIII, 1872, 85, pt. (Manado); *(2)* Platen, Gefied. Welt 1887, 230.
e. **Phlogoenas tristigma** *(1)* Salvad., Cat. B. XXI, 1893, 590.
For further references cf. Salvadori *e 1.*
Figures and descriptions. Wallace *c IV*; Schlegel *d I*; Bonaparte *b 1, c 1*; Salvadori *e 1.*
Adult male. Sinciput bright ochre-yellow; hind head and occiput bluish grey, glossed with golden-green; round hind neck, extending to midway on sides of neck a band of prune-purple about 10 mm broad; mantle and shoulders bluish grey, glossed with green; rest of back, scapulars, upper tail-coverts and middle tail-feathers dark brown glossed with greenish, washed on the wing-coverts and scapulars with chestnut; primaries greyish dusky; outermost tail-feathers greyish blue, becoming washed with green on the inner tail-feathers, increasing towards the middle ones, a broad indistinct dusky band about 25 mm from the end: chin and throat whitish; sides of face and neck pale bluish grey, touched on the ear-coverts with cinnamon; chest bluish grey, washed with ochraceous; sides, flanks, thighs, sides of rump and of upper tail-coverts dark wood-brown, tinged with greenish; lower breast ochre-yellow, bases of the feathers white (the yellow looking as though laid on with a brush); abdomen and most of the under tail-coverts white; under wing-coverts brown, white and fulvous: "iris brown; bill grey-brown; feet cherry red" — Platen. Wing 182 mm; tail c. 138; bill from feathers of forehead 20, from nostril 9; tarsus 45 (♂ ad., Rurukan, 11. Jan. 85: Platen in Nehrkorn Coll., Nr. 906). This specimen closely resembles the plate in the Ibis 1865, pl. IX.

A second specimen (♂ ad., Minahassa, 6. Nov. 86: Platen in Coll. v. Berlepsch) differs from the above in having mantle and shoulders purplish grey glossed somewhat with golden-green in certain lights; primaries dusky brown; tail-feathers, except the four middle ones, blackish, paling into greyish towards the base, and broadly-tipped with light slate-grey; chest grey, glossed with green. Wing 176 mm tail c. 130; tarsus 44; bill 20.

Young. The greater wing-coverts and inner remiges of a russet tint with cinnamon-rufous tips; a broad space of orange-cinnamon from the throat to the white abdomen breaking through the grey of the chest (Gorontalo: Riedel — Nr. 1754).
Distribution. North Celebes: Minahassa — Tondano (Forsten *c 5*), Likupang (Wallace *b 2, c 3, e 1*); Rurukan (Platen *2*, in Nehrkorn Coll. and elsewhere); Gorontalo Distr. (Riedel in Dresden Mus.).

This Ground-pigeon is a very rare bird in North Celebes. A single specimen, the type in the Leyden Museum, was obtained by Forsten, and only one also by Mr. Wallace, who remarks that it feeds on the ground and inhabits the drier forests. Dr. Riedel sent a couple of immature specimens to the Dresden Museum from Gorontalo, 1875, and Dr. Platen alone seems to have obtained anything like a series. The latter had two specimens in captivity during his stay at Rurukan; these were at first extremely wild and refused the grain-food offered to them, but were tempted by earth-worms and soon became tame and accustomed themselves to grain.

In South Celebes the plum-purple nuchal collar is divided by the bronze green of the head and nape, so that a spot is formed on each side of the neck

behind the ear-coverts, and the race has been named *bimaculata* by Count Salvadori, who points out other differences. The two are very distinct from any other members of the genus. Their chief affinities seem to be with the Dagger-wound Pigeons (Dolchstichtauben in German) of the Philippines and Papuasia, especially *P. rufigula* (J. & P.) of the latter subregion. These may be recognised by the patch of bristly feathers of a red colour on the upper breast, by the grey bars formed by the tips of their upper wing-coverts, and by other points.

The genus *Phlogoenas* is found only in part of the East India Islands and Polynesia, the western confines of its range being Celebes and the Philippines; then comes a break, for it is not known in the Moluccas, but reoccurs again in Papuasia as far as the Solomon Islands and, apparently, Tanna in the New Hebrides, passing eastward across the Pacific to the Paumotu Islands (Bow) and to Uap and Ruk in the Carolines. A species, which Count Salvadori refers to this genus with a query, is further found in Wetter and Timor. Count Salvadori enumerates 20 species, not counting four of doubtful validity; to these he appends eight others as unidentified. The genus is a difficult one for the student, some of the species not having been met with since the time of Cook and no specimens being now extant in collections. As a rule, indeed, these Pigeons seem to be rare birds where they do occur, judging from the fact that 8 of Salvadori's 20 good species are represented in the British Museum by only 1 specimen each, 2 by 2 specimens each, and 4 by none.

* 283. PHLOGOENAS BIMACULATA Salvad.

South Celebes Ground-dove.

a. **Phlegoenas tristigmata** *(1)* Wall., Ibis 1865, 393 pt. (Macassar); *(2)* id., J. f. O. 1866, 284 pt.; *(III)* Gould (nec Bp.), B. Asia VI, pl. 59 (1873).

b. **Phlegaenas tristigmata** *(1)* Wall., Malay Archip. 1869, I, 369, 413, pt. (Maros Waterfall).

Phlogoenas bimaculata *(1)* Salvad., Bull. B. O. C. 1892, III, p. X; *(2)* id., Ibis 1893, 120; *(3)* id., Cat. B. XXI, 1893, 591; *(4)* Hart., Nov. Zool. 1897, 160.

Figure and descriptions. Gould *a III*; Salvadori *1*, *2*, *3*.

Adult. Similar to *P. tristigmata*, but somewhat duller, less yellow on the breast, and less coppery amethyst on the hind neck and mantle, two purple-violet spots on the sides of the upper nape, so that the nape along the middle is entirely bronze-green. Size scarcely smaller than that of *P. tristigmata* (Salvad. *3*).

Distribution. South Celebes: — Near Maros Waterfall (Wallace *b 1*); near Macassar (Doherty *4*).

This species, the southern representative of *P. tristigmata*, will possibly prove to intergrade with it somewhere in the middle of Celebes. The southern race seems to be known only by two specimens — the type in the British Museum, figured by Gould *(a III)*, which Mr. Wallace killed near the Maros Falls, and an immature example obtained by Mr. Doherty in July, 1896, having the purple spots on the sides of the nape scarcely indicated and some brown and rusty feathers on the breast (Hartert *4*).

GENUS CALOENAS G. R. Gray.

This large Pigeon, which is of a gallinaceous appearance, is easily distinguishable from other Pigeons by the long hackle-feathers of the neck, by its general plumage of metallic golden-green and violet, by its short tail — white when adult, and by the knob at the base of the bill. The wing is large and broad, the tarsus naked, as also the tibio-tarsal joint, and irregularly scutellated in front. It is of "insular" and wandering habits, and lays a single white egg in nests in trees on certain small islands where it breeds in great numbers.

284. CALOENAS NICOBARICA (L.).

Nicobar Pigeon.

a. **The Nincombar Pigeon** *[I]* Alb., Nat. Hist. B. 1740, III, 44, pls. 47, 48; *[II]* Edw., Glean. 1761, III, 271, pl. 339.

b. **Columba nicobarica** *(1)* Linn., S. N. 1766, I, 283; *[II]* Bonn., Tabl. Enc. Méth. 1790, 246, pl. 80, f. 1; *[III]* Hayes, Portr. Rare & Curious B. 1799, II, pl. 91; *(IV)* Temm. & Knip, Pig. I, 1808—11, fam. trois. p. 5, pl. 2; *(V)* Vieill., N. D. 1818, XXVI, 395, pl. G. 38.

c. **Columbigalline à camail** *[I]* Levaill., Ois d'Afr. 1808, VI, 102, pl. 279.

d. **Columba gouldiae** *(I)* Gray & Hardw., Ill. Ind. Zool. 1834, II, pl. 57 (juv.).

e. **Geophilus nicobaricus** *(I)* Selby, Nat. Libr. Pig. 1835, 221, pl. 29.

Caloenas (variously spelt **Calaenas, Callaenas, Caloena, Calloenas, Callioenas**) **nicobarica** *(1)* Gray, List Gen. B. 1840, 59; *(2)* Bp., Consp. II, 1854, 95; *(3)* Blyth, Ibis 1859, 465; *(IV)* Flower, P. Z. S. 1860, 333, pl. 166, figs. 3, 4 (gizzard anat.); *(V)* Rchb., Tauben 1860, 48, t. 263, figs. 1467—68; *(6)* Jerd., B. Ind. III, 1864, 480; *(7)* Wall., Ibis 1865, 370, 394, 400; *(8)* Bartl., P. Z. S. 1866, 78; *(9)* Ball, J. A. S. B. 1870, XXIX, 32; *(10)* Wald., Tr. Z. S. 1872, VIII, 86; *(11)* Schl., Mus. P.-B., Columb., 1873, 170; *(12)* Ball, Str. F. 1873, I, 81; *(13)* Hume, Str. F. 1874, II, 70, 271; *(14)* Garrod, P. Z. S. 1873, 468, 639; 1874, 250, 257; *(15)* Wald., Tr. Z. S. IX, 1875, 222; *(16)* Sharpe, P. Z. S. 1875, 110; *(17)* Hume, Str. F. 1878, VI, 425; *(18)* Meyer, Ibis 1879, 138; *(19)* Hume, Str. F. 1879, VIII, 68; *(20)* Rams., Pr. L. Soc. N. S. W. III, 1879, 295; *(21)* Finsch, Ibis 1881, 538; *(22)* Sharpe, Journ. L. Soc. 1882, XVI, 446; *(23)* Salvad., Orn. Pap. III, 1882, 209; *(24)* Oates, B. Brit. Burmah 1883, II, 299; *(25)* Meyer, Isis, Dresden 1884, 6, 52; *(26)* Guillem., P. Z. S. 1885, 576, 663; *(27)* Woodford, P. Z. S. 1888, 248; *(28)* W. Blas., Ornis 1888, 317, 626, 642; *(29)* Hickson, Nat. in N. Celebes 1889, 183; *(30)* Everett, J. Str. Br. R. A. S. 1889, 194; *(31)* Sh. & Whiteh., Ibis 1890, 137; *(32)* Sharpe, t. c. 284; *(33)* Steere, List Coll. B. & M. Philipp. Is. 1890, 24; *(34)* Oates ed. Hume's Nests & Eggs Ind. B. 1890, II, 365; *(35)* Vorderm., N. T. Ned. Ind. 1890, L, 507; *(36)* id., Notes Leyd. Mus. 1891, 129; *(37)* Evans, Ibis 1891, 74; *(38)* Salvad., Agg. Orn. Pap. 1891, III, 193; *(39)* id., Cat. B. XXI, 1893, 615; *(40)* Sharpe, Ibis 1894, 243, 257; *(41)* Bourns & Worc., B. Menage Exp. 1894, 30; *(42)* Hart., Nov. Zool. 1896, 248, 576.

f. **Nicobar Pigeon** *(1)* Wall., Malay Archip. 1869, II, 65; *(2)* Guillem., Cruise "Marchesa" 1886, 241; *(3)* Newton, Dict. B. pt. 3, 1894, 724.

"Mahawa", Banka Island (N. of Celebes), Dresden Mus.
"Burong mas" (Gold Bird), Malay name in Great Sangi, Hickson *29*.

For further synonymy and references cf. Salvadori *39*.

Figures and descriptions. [Albin *a I*; Edwards *a II*; Bonn. *b II*; Hayes *b III*; Vieillot *b V*; Levaillant *c I*; Rchb. *V*]; Knip *b IV*; Gray & Hardwicke *d I*; Selby *e I*; Hume *13*; Salvadori *23*, *39*; Oates *24* (ex Hume).

Adult. Metallic green, with coppery reflections, duller below; cervix clothed with hackle-feathers of great length, green and blue; head all round, nape and upper breast blackish, the sides of the head and the upper breast glossed with blue; remiges, outer upper wing-coverts and carpal edge blue, blending with the green of the back, the outer primaries brownish black; tail and longer under tail-coverts pure white; remiges below and inner under wing-coverts dusky brown: "iris deep brown; bill, cere and fleshy protuberance at the base of the culmen dark blackish grey or deep slaty; legs and feet varying from pinkish lake to dull purplish lilac, claws chrome yellow, the soles dull greyish yellow" — Hume *13* (Siao: Meyer — Nr. 13833).

Female. "Similar to the male, but smaller, narrow feathers of the neck shorter, and also the frontal knob smaller" (Salvad. *39*).

Young. The long cervical hackle-feathers wanting; tail blackish glossed with blue: "iris grey-brown; bill black, tip pale, feet black-brown" (♂ juv., Puerto Princesa, Palawan, 4. Nov. 87: Platen — Nr. 13190).

Measurements. Wing ca. 250 mm; tail 95; tarsus 46; exposed bill 26.

Fgg. 1 in number, white, shell very finely pitted, almost glossless: size 47 × 32 mm (Hume *34* — Batty Malve, Nicobars). Size 43 × 33 mm (Nehrkorn Coll. from the Berlin Zoolog. Gardens).

Nest. A platform of twigs, very loosely and carelessly put together, in bushy trees, usually 20 to 30 feet from the ground (Davison *13*, *34*).

Distribution. Nicobars (Hume & Davison *13*, etc.): Andamans (Blyth *3*, Davison *13*); Cocos (Phayre fide Blyth *12*, *23*), Mergui Is. (Helfer fide Blyth *23*); Noordwachter Id. in Java Sea (Vorderman *35*); Satonda Id. (Doherty *42*); small islands off Billiton, e. g. Pulo Lima (Vorderman *35*, *36*); Labuan (Low *16*); Tega Is., near Borneo (Whitehd. *30*, *31*); Mantanani Is. near Borneo (Everett *30*); Mangsi Id. (Peale *30*); Palawan (Platen *28*, *30*); Mindoro (Steere *33*); Negros, Tawi-Tawi and Sooloo (Bourns & Worcester *41*); Sibutu, Sooloo Is. (Everett *40*); Great Sangi (Meyer *18*, *25*, Hickson *29*); Siao (Meyer *25*); Banka (Dresd. Mus.); Minahassa (v. Musschenbr. *18*); "some small islands near Macassar" (Wallace *f 1*); Moluccas — Ceram, Obi, Batchian, Kaioa, Ternate, Halmahera, Morty; Papuasia — Waigiou, Salawatti, Koffiao, Peean near Mysol, N.W. Penins. of New Guinea, Jobi, Miosnom, Mafoor, Mysore, Kei Is., Huon Gulf in S.E. New Guinea, Port Moresby, Deboyne Id., Ludovician Id., Duchateau Id., Normanby Id., Credner Id., Louisiade Is., New Ireland, Duke of York, Anchorite Is., Solomon Islands (fide Salvadori *23*, *38*, *39*); Trobriand and Egum Is. (Meek *42*); New Britain (fide B. Geisler).

The Nicobar Pigeon is the sole representative of its genus *Caloenas*, and subfamily *Caloenadinae*, if we except the closely allied local form, *C. pelewensis* of the Pelew Islands, which Count Salvadori holds distinct on account of its smaller size and bluer tints. In appearance its stout heavy body, strong legs, and the lustrous hackles of its neck are strongly suggestive of the *Gallinae*, but

this similarity is not borne out by the structure of the skeleton[1]) which is dove-like, nor by other considerations. Davison *(13)*, who has given the best account of the habits of these birds, writes from observations made in Batty Malve: "Their gait is quite pigeon-like, every now and then one would stop, and tossing the leaves aside, dig into the ground with its bill; they did not move in any regular manner but walked hither and thither, and if two adults, or two young ones met, they generally made a peck or two at each other before separating. I did not observe them use their feet to scratch aside the leaves, like gallinaceous birds, nor did I see any of the adults run, they kept to a steady but sprightly walk the whole time. Occasionally a young one would rush up with outspread wings to one of its neighbours, and then stand with open mouth flapping its wings till it was either beaten off, or the other beat a retreat, but I did not see any of the young fed by their parents. They are very silent birds, and the only note I heard was a somewhat hoarse guttural kind of croak, not unlike that sometimes made by a domestic pigeon when taken in the hand". Mr. Whitehead *(31)* speaks of the note as a powerful "Coo".

Hume and Davison *(13, 34)* express the opinion that the small, uninhabited, and almost inaccessible island of Batty Malve is the only spot in the Nicobars to which these pigeons resort to breed. Here, says Hume, they "swarm by thousands, and in the early morning may be seen flying from the island in flocks out to sea, doubtless to other islands of the group to feed. When well up in the air their flight is swift and powerful, and they remind one much of sand grouse". They appear never to lay more than one egg, which is deposited in a true pigeon's nest of twigs in a tree. Mr. Whitehead heard of a breeding-place on some small islands out at sea near Pulo Tega Island, Borneo, and our artist, B. Geisler, learnt from the natives that there is a breeding-place in the Katakatei District of the Gazelle Peninsula, New Britain, and another, from other sources of information, on the Purdy Islands. It also seems to breed freely in confinement, and Mr. Bartlett *(8)* ascertained from birds in the Gardens of the Zoological Society of London that the period of incubation is as much as 28 days, or much longer than that of other Pigeons known to Mr. Evans *(37)*, with the exception of *Goura*, in which it is also 28 days.

The Nicobar Pigeon has a vast range, occurring as it does from the Nicobars to the Solomon and Louisiade Islands, a distance of some four thousands miles. But the most remarkable thing about the bird is its preference for small islands; it avoids the large masses of land and establishes itself on the small neighbouring islets. Thus, there is no positive evidence that it has ever been met with in Tenasserim, the Malay Peninsula, Sumatra, Java and Borneo; in Celebes it has only been encountered on the Northern Peninsula (van Musschenbroek) and there it must be very rare and most likely a casual visitor; it seems to be almost equally

[1]) The skeleton has not yet been figured, only the scapula by Fürbringer: Unters., 1888, pl. III, fig. 93, but there is a specimen in the Dresden Museum.

chary about setting its foot on the mainland of New Guinea. On small islands, on the other hand, it has been recorded from the Mergui Islands off Tenasserim, it abounds in some of the Nicobars, though, like the Gannets of European seas, it has a favourite breeding-island; it does not occur, as Dr. Vorderman says, on the mainland of Billiton, but on some small islands near the coast; it has not been met with yet on the mainland of Borneo, but on the small islands of Labuan, Tega and others, Mantanani, Mangsi and Sibutu: it is found on small islands near Macassar *(f 1)*, but has not been recorded from the neighbouring coast of Celebes; in the Solomon group Mr. Woodford has noticed, "especially on the island of Malayta, that the Pigeons leave the mainland of the large islands and resort at night in thousands to roost on the small detached islands off the coast". These curious habits, which we have termed *insular* (cf. *Myristicivora bicolor*, *Carpophaga concinna*, *Carpophaga pickeringi*), Mr. Wallace *(f 1)* believes to be accounted for in *Caloenas* by the circumstance that "being a ground feeder it is subject to the attacks of carnivorous quadrupeds, which are not found in the very small islands". In the Solomons Mr. Woodford could only account for it by the supposition that the birds find themselves free from the attacks of the large Monitor Lizards, which are less plentiful there than on the mainland. Such enemies are most likely more dangerous to the eggs and nestlings than to the old birds, which look as if they ought to be able to look out for themselves as well as the average mainland dwellers; but, it must be confessed that their resorting to small islands to roost shows superior wisdom in taking care of themselves. Of course, if all Pigeons were to adopt insular habits (if only as regards roosting), it requires no very vivid imagination to see that the result would not be profitable to them. Looking for the origin of this habit in the species which have adopted it, it seems clear that the insular species of *Myristicivora* and *Carpophaga* have no structural peculiarities to render them specially adapted to this mode of life; it appears likely that they were species which were getting the worst of the struggle for existence on the mainland, and gradually adopted themselves to the small islands, of which they have become the peculiar inhabitants.

The wide distribution of this species is due to its traversing spaces of sea by flight. Mr. Hume, as mentioned above, saw flocks of it flying from Batty Malve out to sea evidently on the way to other islands of the Nicobars. Mr. Whitehead writes *(31)* that it is "very plentiful on the small islands at some distance from the coast of Borneo. This Pigeon migrates from island to island, and was very common on Pulo Tega in April, where in most months it would be difficult to find a bird". Meyer says it is a common species in the Sangi Islands, yet no other naturalist has succeeded in finding it there; this is probably because it is present there only at certain times. Mr. Wallace *(f 1)* records a case of one of these birds flying as far as a small coral island, a hundred miles north of New Guinea, with no intervening land. "After the island had been settled a year, and traversed in every direction, the son (of Mr. van

Duivenbode, the owner) paid it a visit; and just as the schooner was coming to an anchor, a bird was seen flying from sea-ward which fell into the water exhausted before it could reach the shore. A boat was sent to pick it up, and it was found to be a Nicobar pigeon, which must have come from New Guinea, and flown a hundred miles, since no such bird previously inhabited the island". Mr. Woodford *(27)* records a similar fact: "One flew on board and settled for some seconds, when we were distant forty miles to the westward of Renual Island — an outlying island that can be hardly said to belong to the Solomon group at all". The species may ultimately prove to be a sort of "gipsy migrant", like *Myristicivora bicolor*, its local wanderings being due to the ripening of fruits and seeds on different islands. Mr. Geisler says that this is the case on Pigeon Island off the Gazelle Peninsula, N. Britain. Wiglesworth has wrongly suggested that it appears to possess "an extraordinarily fixed, invariable constitution — to be less plastic than other species under the conditions which promote change, perhaps on account of its relatively greater antiquity" (*Aves Polynesiae*, Introduction), but now that its wandering habits are known, it will be seen that there is no reason to suppose it to be less variable than other Pigeons.

The gizzard of the Nicobar Pigeon, as was first shown by Sir W. Flower *(4)* and later remarked by Davison in the Nicobars *(13)*, is furnished interiorly with two long disks, "between which is a single pebble usually of white quartz a little larger than a fresh pea". "The stomachs of all those I shot on Katchall contained seeds very similar to a prune stone, more or less broken up, but on Batty Malve they seemed to have eaten a whitish seed about the size of the head of a blanket pin". Prof. Newton *(f 3)* draws attention to the remarks of Garrod (P. Z. S. 1878, 102) and of Verreaux and Des Murs on the corresponding "nut-cracking" gizzards of *Carpophaga latrans* of Fiji and of *Phaenorhina goliath* of New Caledonia.

ORDER GALLINAE.

The young of the *Gallinae* are hatched on the ground, are covered with down and are capable of running about and feeding themselves almost immediately on leaving the egg; or, in the case of the *Megapodes*, they are hatched by the heat of the sun or other agency in the ground in which the egg has been buried by the parents, and they are in some (if not in all) cases capable of flying on leaving the egg. These peculiarities distinguish the *Gallinae* from the orders hitherto treated of, though not from the *Turnices*, *Ralli*, *Grallae*, and others.

The *Gallinae* are of terrestrial habits, walking and running well — needless to say never hopping; in diet they are phytophagous and probably feed also

upon any small forms of lower animal life; they use their feet in scraping up the ground in search of food, or for dusting themselves and, in the case of many species of the *Megapodes*, raise large mounds in this manner in which to bury their eggs.

Dr. Gadow (Bronn's Kl. & Ord. VI, pt. 4, 1893, II, 174) considers that the *Galli* have affinities with the *Turnices* and *Tinami*, and in a less degree with the Rails. These have all a U-shaped furcula, without any hypoclidium, in the *Galli* it is V-shaped with the latter process. The *Galli* have a large crop; in the *Turnices* and *Ralli* this is absent, but it is well developed in the *Tinami*. From the *Charadriidae* the *Galli* may be distinguished, as Gadow points out, by their having 10 (instead of 11) primaries and by the plagiocoelous (cf. Dict. B. p. 142) loops of the intestines; from the *Gruiformes* by the intestinal arrangement, and by the strong spina sterni; from the *Tinami* by the hypotarsus with one or more canals, by the absence of impressions of supraorbital glands, and by the bill being covered with a smooth horny rhamphotheca. For further anatomical characters see Gadow l. c. and in Newton's "Dictionary of Birds". In the *Megapodes* the 5th secondary is supposed to be absent, but this requires reinvestigation.

The *Galli* have normal toes — three in front and one behind, and the order is divided by Gadow and by Ogilvie-Grant into two groups or suborders, *Alectoropodes* and *Peristeropodes*, according as the hallux is raised above the other toes or on a level with them. Celebes has but few representatives of this order, and of these *Excalfactoria* and *Gallus* belong to the *Alectoropodes*, and *Megapodius* and *Megacephalon* to the *Peristeropodes*.

FAMILY PHASIANIDAE.

The Partridges, Quails, Pheasants, Peacocks, Turkeys, and Colins are gathered into a family by Mr. Ogilvie-Grant (Cat. B. XXII, 1893), who distinguishes them from the Grouse-family, *Tetraonidae*, by their having the nostrils never hidden by feathers, the tarsi partially or entirely naked, and often armed with spurs; the toes naked, and never pectinated along the sides.

GENUS EXCALFACTORIA Bp.

The size of a Lark; tail-feathers 8 in number (Grant), entirely concealed by the much longer upper tail-coverts and difficult to examine; bill shorter than the cranium, the maxilla overlapping the mandible both at the tip and at the sides; tarsus yellowish, bare, except quite at the tibio-tarsal joint in front, reticulate, equal in length to the middle toe and claw; hallux much reduced, about half the length of the lateral toes; wing short, rounded to fit the body, second-

aries about $^5/_6$ its length, tip formed by the 2nd to 5th quills, the first scarcely shorter[1]). Sexes dissimilar. Strictly terrestrial. Sociable, consorting in coveys.

285. EXCALFACTORIA CHINENSIS (L.).

Blue-breasted Quail.

a. **Chinese Quail** *(I)* Edw., Glean. V, 77, pl. 247 (1758).

b. **Coturnix philippensis** *(I)* Briss., Orn. 1760, I, 254, pl. XXV, f. 1.

c. **Tetrao chinensis** *(1)* Linn., S. N. 1766, I, 277; *(2)* Gm., op. cit. 1788, I, 765 (sinensis).

d. **Coturnix excalfactoria** *(1)* Temm., Pig. et Gall. 1815, III, 516, 742; *(2)* Joest, Das Holontalo 1883, 105.

e. **Coturnix chinensis** *(1)* Strickl., P. Z. S. 1842, 167; *(2)* Schl., Handl. Dierk. 1857, 394; *(3)* Bernst., N. T. Ned. Ind. 1860, XXII, 33; *(4)* id., J. f. O. 1861, 189; *(5)* Mottl. & Sclat., P. Z. S. 1863, 221; *(6)* Swinh., Ibis 1869, 348; *(7)* Hartl., Vög. Madag. 1877, 405; *(8)* Legge, B. Ceylon 1880, 755; *(9)* Vorderm., N. T. Ned. Ind. XLI, 1882, 209.

f. **Synoicus chinensis** *(I)* Rchb., Syn. Av., Gallinac. 1848, t. 192, fig. 1668—70; *(II)* Gld., B. Austr. 1848, V, pl. 92; *(III)* Diggles, B. Austr. II, pl. 96 (1868).

Excalfactoria chinensis *(1)* Bp., Compt. Rend. 1856, XLII, 881; *(2)* Jerd., B. Ind. III, 591 (1863); *(3)* Swinh., P. Z. S. 1863, 308; *(4)* id., Ibis 1863, 398; *(5)* Sclat., t. c. 104; *(VI)* Gld., B. Asia VII, pl. 6 (1867); *(7)* Wald., Ibis 1872, 106; *(8)* Salvad., Cat. Ucc. Borneo 1874, 311; *(9)* Oates, Str. F. 1875, III, 345; *(10)* Wald., Tr. Z. S. 1875, IX, 224, 251; *(11)* David & Oust., Ois. Chine 1877, 397; *(12)* Sharpe, P. Z. S. 1879, 350; *(13)* Hume, Str. F. 1879, VIII, 69; *(14)* Oates, t. c. 167; *(XV)* Hume & Marsh., Game B. Ind. II, 162, pl. (1879); *(16)* Hume & Inglis, Str. F. 1880, IX, 258; *(17)* Reid, ib. 1881, X, 63; *(18)* Oates, ib. 1882, X, 236; *(19)* Kelh., Ibis 1882, 3; *(20)* Nichols., ib. 1883, 255; *(21)* Kutter, J. f. O. 1883, 293, 316; *(22)* Oates, B. Brit. Burmah 1883, II, 334; *(23)* W. Blas., J. f. O. 1884, 215, 224; *(24)* Guillem., P. Z. S. 1885, 272, 416; *(25)* A. Müll., J. f. O. 1885, 160; *(26)* Kutter, t. c. 353; *(27)* W. Rams. Ibis 1886, 160; *(28)* Hume, Str. F. 1888, XI, 310; *(29)* Everett, J. Str. Br. R. A. S. 1889, 200; *(30)* Oates ed. Hume's Nests and Eggs Ind. B. 1890, III, 448; *(31)* Steere, List Coll. B. & M. Philipp. Is. 1890, 25; *(32)* Vorderm., N. T. Ned. Ind. XLIX, 1890, 414; *(33)* id., ib. L, 1890, 514; *(34)* Sh. & Wh., Ibis 1890, 140; *(35)* Sh., t. c. 284; *(36)* Vorderm., Notes Leyd. Mus. 1891, XIII, 129; *(37)* Salvad., Ann. Mus. Civ. Gen. 1891, (2) XII, 74; *(38)* De La Touche, Ibis 1892, 494; *(39)* Grant, Cat. B. XXII, 1893, 250; *(40)* Hose, Ibis 1893, 423; *(41)* Sharpe, Ibis 1894, 242, 257; *(42)* M. & Wg., Abh. Mus. Dresd. 1895, Mai, Nr. 8, p. 16; *(43)* Grant, Handb. Game B. 1895, 193; *(44)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 14; *(45)* Rickett & De La Touche, Ibis 1896, 493; *(46)* Hartert & Everett, Nov. Zool. 1896, 598.

g. **Excalfactoria minima** *(1)* Gld., P. Z. S. 1859, 128; *(II)* id., B. Asia VII, pl. 7 (1867); *(3)* Blyth, Ibis 1867, 161; *(4)* Wald., Tr. Z. S. 1872, VIII, 87; *(5)* id., ib. IX, 1875, 224; *(6)* Salvad., Ann. Mus. Civ. Gen. VII, 1875, 675; *(7)* id., Orn. Pap. III, 1882, 255; *(8)* Pleske, Bull. Ac. Sc. Petersb. 1884, 133; *(9)* Salvad., Agg. Orn. Pap. III, 1891, 195.

h. **Synoecus sinensis** *(1)* E. Newt., Ibis 1861, 116, 275.

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[1]) Mr. Ogilvie-Grant puzzles the readers of his excellent Catalogue by the statement: "1st primary slightly shorter than the 2nd and equal to the 3rd, which is slightly the longest"!

i. **Excalfactoria australis** *(1)* Gld., Hb. B. Austr. 1865, II, 197; *(2)* E. Rams., Ibis 1868, 279; *(3)* id., Tab. List 1888, 19.

j. **Coturnix minima** *(1)* Rosenb., Malay. Archip. 1878, 275.

k. **Excalfactoria sinensis** *(1)* Hume & Davison, Str. F. VI, 1878, 447.

l. **Excalfactoria lineata** *(1)* Grant, Cat. B. XXII, 1893, 253; *(2)* Bourns & Worces., B. Menage Exped. 1894, 29; *(3)* Grant, Handb. Game-Birds 1896, 196; *(4)* id., Ibis 1895, 193.

"Bilu-Bilulu", Gorontalo Distr., Rosenb. *j 1*, Joest *d 2*.

For further synonymy and references cf. Grant *39*, and *l 1* (with exceptions).

Figures and descriptions. Gould *f II*, *VI*, *g II*, *i 1*; [Edwards *a I*, Brisson *b I*]; Reichenbach *f I*; Diggles *f III*; Hume & Marsh. *XV*; Hartl. *e 7*; Legge *e 8*; Vorderman *e 9*; Oustalet *11*; Oates *22*; Salvadori *g 7*; Grant *39*.

Male adult. Above bistre, the feathers blotched and vermiculated with black, chiefly on the inner web near the end, some with fulvous shaft-streaks; remiges dull drab; forehead, upper tail-coverts, and greater wing-coverts washed with slaty-grey; sides of head, jugulum, sides of breast, and flanks slaty grey; other under-parts chestnut; throat and rictal streak black, enclosing a malar streak of white; lower throat white, bordered with black; under wing-coverts pale drab, mixed with white; remiges below pale drab: "feet orange-yellow; iris lake-brown; bill black" — Whitehead *34* (♂, "von Tondano lebend erhalten", 13. Sept. 93: P. & F. Sarasin).

"In very old examples the shaft-stripes entirely disappear"; and: "the chestnut on the under-parts gradually takes the place of the slate blue till very little of the latter remains" — Grant *39*.

Younger male. Has the black markings on the upper surface broader, on the sides of the breast a few feathers with dark brown cross-bars (♂, Tondano, 13. Sept.: P. & F. S.).

Female. Above like the male, but without any slaty wash on forehead, upper tail-coverts and wing-coverts; below more fulvous brown, barred with dark brown, most broadly on the flanks; middle of abdomen and throat whitish; malar stripe and behind the ear-coverts dotted with dark brown.

In very old females the barring on the chest nearly disappears (Grant *39*).

Immature female. Has the feathers of the upper breast and sides spotted. As age increases these spots resolve themselves into transverse black bars (Grant).

Young. The young in first plumage are probably similar to the imm. fem.; it appears that the male quickly assumes the adult dress, but evidence is wanting.

Measurements (4 adults: N. Celebes). Wing 67—70 mm; tarsus 17.5—18.5; bill from ant. marg. nostr. 6 mm. The sexes are of equal size. North Celebesian specimens are not smaller than those of the Philippines (Mindanao, Cebu). Two from Macassar: wing 65, 66 mm (P. & F. S.).

Eggs. Java — not more than six; greyish olive-green or olive-brown, sprinkled more or less abundantly with olive-brown spots: size 25 × 19 mm (Bernstein *e 4*). Labuan — varying from dark olive-brown with few black dots, to pale olive-brown where the black dots are more numerous: size 25.4 × 19 mm (Sharpe *12*). For further descriptions of eggs and nest cf. Hume *30*, Indian countries; Legge *e 8*, Ceylon; Swinhoe *4*, Formosa; A. Müller *25*, Salanga; Mottley & Sclater *e 5*, Borneo; Kutter *26*, Borneo; Sharpe & Whitehead *34*, Borneo; Walden *7*, Negros; E. P. Ramsay *i 2*, Australia.

Nest. A hollow in the ground scraped out by the hen, lined with loose dry grass-stalks and roots (Bernstein *e 4* — Java).

Distribution. India — except N. W. (Jerdon, etc. *e 8, 39*); Ceylon (Legge, etc. *e 8*); Burmah (Oates *9, 14, 22*); Tenasserim (Davison *k 1*, etc.); South China (Swinhoe *3*, De La Touche *38*); Formosa and Hainan (Swinhoe *6, 8*); Malay Peninsula (Cantor & Maingay *39*, Davison *13*, Kelham *19*); Sumatra (H. O. Forbes *20*, Modigliani *37*); Java (Horsfield *8*, Bernstein *e 3, e 4*, etc); Billiton (Vorderman *33, 36*); Borneo (Mottley *e 5*, Low *12*, etc.); Palawan (Whitehead *29*); Luzon (Sonnerat, Mait.-Heriot *27*); Negros (Steere *31*); Cebu (Burger in Dresd. Mus.); Mindanao (Platen in Dresd. Mus.); Sooloo Is. — Sooloo (Guillem. *24*), Bongao (Everett *41*); Panay, Cebu, Masbate, Calamianes (Bourns & Worcester *l 2*); Celebes — Minahassa (P. & F. Sarasin), Gorontalo Distr. (v. Rosenb. *j 1*, Joest *d 2*), Macassar (Wallace *g 1, 39*, P. & F. S. *44*); Halmahera (Wallace, Bernst. *g 7*), Ternate (Fischer *g 8*); Australia — Queensland, New South Wales, Victoria and South Australia (Ramsay *i 3*).

Introduced into Mauritius (E. Newton *h 1*) and ? Bourbon (Maillard *5, e 7*).

Within the wide range — India to South Australia — shown above, this minute Quail is subject to some local modifications. Gould recognised three species, separating Wallace's specimens from South Celebes as *E. minima*, "the smallest of the *Gallinaceae*", and calling the Australian birds *E. australis*. Mr. Ogilvie-Grant groups his specimens as belonging to two forms, the *typical E. chinensis* ranging from India and China to Malacca, reoccurring in Celebes and Ternate, and *E. lineata* (Scop.)[1] of the Philippines, Borneo, Sumatra and Java, with which the Australian birds are united. *E. lineata* is said to be darker above, more strongly blotched with black; the female more strongly barred below. So far as can be judged from the specimens in the Dresden Museum we should say that Australian birds alone bear out the differences to which Mr. Grant draws attention; the Sarasins' North Celebesian examples (the bird seems possibly to differ somewhat in the South) cannot be separated from others from the Philippines and Borneo; they are neither paler nor, as Gould believed, smaller. If the birds of any special locality be separated by name, it appears to us that these should be those of Australia (as *E. chinensis australis* by those who make use of trinomials, or by some other sign by others), but there is so much still to be learnt about the variation of the species that it will be a long time before it is possible to define its local differences with accuracy. Till then nothing is gained by applying names; they only suggest knowledge which we have not got.

In some parts of its range the Chinese Quail is a migrant; this Mr. Oates repeatedly states to be the case in Pegu, where it arrives in great numbers with the rains in May; in the Lucknow Division of India also it is only to be found, so far as Mr. Reid *(17)* could ascertain, during the rains. In some other quarters it is known to be a resident; this, for instance, is the case, according to Inglis *(16)*, in N. E. Cachar, and, according to Legge, at Colombo, Ceylon. It has been recorded as a breeding species in India, Ceylon, Burma, Formosa,

[1] It appears certain that Scopoli founded his species on Sonnerat's *Petite Caille de l'Isle de Luçon*, though it is perfectly impossible to identify the bird by his description. Sonnerat figures the female

Salanga, Java, Borneo, the Philippines probably, and Australia; and in tropical regions birds are generally resident in countries where they breed, though they may shift their quarters for food. With such species local differences are not unlikely to occur. *E. chinensis* alters, as Mr. Ogilvie-Grant shows, considerably with age, and individual variation must also be allowed for.

E. chinensis is most nearly allied to *E. lepida* Hartl. of the New Britain group, which has the whole of the breast bluish slate, and only the abdomen chestnut. The single other species of the genus *Excalfactoria*, *E. adansoni* (Verr.), is found in Africa from about the equator southwards; this differs more widely.

Very few naturalists have met with this species in Celebes, perhaps on account of its preferring the stretches of open ground of the country, instead of forest. Rosenberg *(j 1)* describes it as resorting to districts covered with high grass-growths, for instance, near Limbotto and Bone. "Like our Quail the little creature rises before the feet of the sportsman, flies a few yards straight as a line over the ground, falls again, and runs away further". Bernstein *(e 4)* writes of it in Java: "This pretty little bird specially frequents the thick, wide-spread Alang-Alang wastes in which it can easily hide between the high stalks, it also occurs not rarely on pasture and fields near the villages. It flies unwillingly, and tries to escape danger rather by running, or by squatting on the ground. Owing to its quiet and concealed kind of life it is difficult to observe its habits and economy. Its food consists of insects, worms, and various seeds. I myself have kept several individuals alive for a long time with small grasshoppers and other insects. They remained, however, always shy, and often injured themselves by wildly fluttering about. Their call-note is a soft "düdüdü" or "dühdüdi", at first loud and gradually getting weaker. The nest I have several times found" (cf. *supra*). Its habits in Borneo are remarked upon by Mottley (*e 5* — in whose care some twenty caged specimens became very tame), in Ceylon by Legge *(e 8)*, in India by Jerdon *(2, VI)*, in Pegu and Tenasserim by Oates and Davison, and elsewhere by other authors.

GENUS GALLUS Temm. (from L. and Briss.).

The Jungle Fowl may be easily recognised by its comb and wattles, by the long hackle-feathers of the neck and rump (in the male), by the rectrices bilaterally pressed together into a gable-shape, and in the male greatly lengthened, by the spur on the tarsus of the male. Four species are known, the cocks of three of which crow differently, as no doubt the fourth does also.

The genus ranges from India to Lombok, perhaps further, and *Gallus ferrugineus* is found in a wild state in many other localities, in some of which it has certainly, in others most likely, been introduced by man.

286. GALLUS FERRUGINEUS (Gm.).

Jungle Fowl.

a. **Phasianus gallus** *(1)* Linn., S. N. 1766, I, 270.

b. **Hackled Partridge** part. *(I)* Lath., Gen. Syn. 1783, II, 766, pl. 66 (first descr. only, = ♀).

c. **Tetrao ferrugineus** *(1)* Gm., S. N. 1788, I, 761 (♀, after Latham).

d. **Gallus bankiva** *(1)* Temm., Pig. et Gall. 1813, II, 87; *(2)* Horsf., Tr. L. S. XIII, 1821, 185; *(III)* Guérin, Icon. Règ. Anim., Ois. 1829—38, 26, pl. 42, figs. 2, 2a; *(IV)* J. E. Gray, Ill. Ind. Zool. 1830—32, pl. 43, f. 3; *(V)* Schinz, Abbild. Vög. 1833, 342, pl. 94; *(VI)* Jard., Nat. Libr., Orn. 1834, IV, 175, plate; *(VII)* Schinz, Nat. Vög. 1853, 145, pl. 69; *(8)* Darwin, Anim. & Plants 1868, I, 233 et sequ.; *(9)* Wald., Tr. Z. S. 1872, VIII, 86; *(10)* Rosenb., Malay. Archip. 1878, 275; *(11)* Meyer, Ibis 1879, 138, 146; *(XIbis)* id., Vogelskel. I, 1879, t. IX; *(12)* Wardl. Rams., Tweedd. Orn. Works, Index 1881, 659; *(13)* Guillem., P. Z. S. 1885, 248, 272; *(14)* Vorderm., N. T. Ned. Ind. 1885, XLV, 404; *(15)* id., ib. 1886, XLVI, 81; *(16)* Everett, J. Str. Br. R. A. S. 1889, 199; *(17)* Whitehead, Ibis 1890, 40, 57; *(18)* Steere, List Coll. B. & M. Philipp. Is. 1890, 25; *(19)* Sharpe, Ibis 1894, 241, 257.

Gallus ferrugineus *(1)* Jerdon, B. Ind. 1863, III, 536; *(2)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 674; *(3)* David & Oust., Ois. Chine 1877, 421; *(4)* Hume & Davis., Str. F. VI, 1878, 442, 521; *(5)* Hume, ib. VIII, 1879, 68; *(6)* Salvad., Ann. Mus. Civ. Gen. XIV, 1879, 251; *(7)* Kelh., Ibis 1882, 1; *(8)* Oates, B. Brit. Burm. 1883, II, 322; *(9)* W. Blas., J. f. O. 1883, 115; *(10)* Büttik., Notes Leyd. Mus. 1887, 78; *(11)* Hartert, J. f. O. 1889, 379; *(12)* Hagen, T. Ned. Aard. Genoots. 1890, (2) VII, 161; *(13)* Tegetm., Ibis 1890, 304 et sequ.; *(14)* Oates, ed. Hume's Nests & Eggs Ind. B. 1890, III, 417; *(15)* Hartert, J. f. O. 1891, 301; *(16)* Newton, Dict. B. pt. 1, 1893, 289; *(17)* Styan, Ibis 1893, 435; *(18)* Büttik., Zool. Erg. Weber's Reise in Ost-Ind. 1893, III, 281; *(19)* M. & Wg., Abh. Dresd. Mus. 1895, Nr. 8, p. 16.

e. **Gallus gallus** *(1)* Grant, Cat. B. 1893, XXII, 344; *(2)* Bourns & Worc., B. Menage Exp. 1894, 29; *(3)* Hart., Nov. Zool. 1896, 564, 598.

"Ajam utan" (Forest-fowl), Malay, N. Celebes, Meyer *d 11.*

"Mano-Ohuta" [Gorontalo Distr.], Rosenb. *d 10.*

For further synonymy and references cf. Grant *e 1.*

Figures and descriptions. Guérin *d III*; J. E. Gray *d IV*; Schinz *d V*, *d VII*; Jardine *d VI*; Vorderman *d 14*; Jerdon *1*; David & Oustalet *3*; Oates *8*; Grant *e 1*; Meyer *d XIbis* (skel.).

Adult male (not old). Above very glossy burnt sienna-red, the neck and lower back clothed with long sickle-feathers; ulnar and carpal region above and most of greater upper wing-coverts black, glossed with blue and green; remiges dusky black, externally deep cinnamon-rufous, more or less vermiculated with black; tail and upper tail-coverts black, strongly glossed with green; entire under-parts black with a green gloss: on each side of throat a wattle, these, with comb and bare skin of face and throat red; "legs purpurescent-brown; claws dark bluish horn; iris orange-red; bill dark brown, reddish towards the base, and paler at the tip of lower mandible" — Oates *8* (♂, Kema, 7. Oct. 1893: P. & F. Sarasin). Wing 235 mm; tail 390; bill from nostril 14; tarsus 78.

Three other males from the Minahassa — one older, the other two younger

than that described — display a much lighter, more orange-ferruginous dress, varying also considerably among themselves.

Adult female. Head above dark brown, becoming black with broad light tawny margins on the feathers of the neck; remaining upper-parts, flanks and under tail-coverts warm brown, fretted and vermiculated with black; jugulum, breast and abdomen pale hazel, with light shaft-streaks; remiges dusky drab; outer tail-feathers blackish (Java: v. Schierbr. — Nr. 10142).

Remark. A specimen, marked ♀, killed by the Drs. Sarasin near the village of Duluduo between the Minahassa and Gorontalo, 17. Dec. 1893, is entirely brown-black, with a gloss of green, and the feathers of the neck bordered with whitish. A small comb and two small wattles on the sides of the throat are present. The Drs. Sarasin are probably correct in surmising that it is a bastard — i. e. between a native domestic fowl and *G. ferrugineus*.

Skeleton.

Length of cranium . . .	68.3 mm	Length of tibia	119.2 mm
Greatest breadth of cranium	29.0 »	Length of tarso-metatarsus .	78.0 »
Length of humerus . . .	72.4 »	Length of sternum . . .	110.0 »
Length of ulna	74.0 »	Greatest breadth of sternum	47.5 »
Length of radius	67.0 »	Height of crista sterni . .	30.7 »
Length of manus	65.8 »	Length of pelvis	106.1 »
Length of femur	81.0 »	Greatest breadth of pelvis .	52.0 »

Young in down. The chicken is fulvous, browner on hind neck, more chestnut down middle of back and on flanks; a buff stripe down each side of the back; only seven primaries sprouted: bill, legs and feet yellowish white (2 specimens, Kema, 3. Aug. 1893: P. & F. Sarasin).

Eggs. Two found near Manado were longer than the eggs of the domestic fowls of Celebes (Meyer *d 11*). "The egg in my collection taken by Oates in Pegu measures 41.5 × 30 mm. The colour is pale clay-yellow. The numerous pores have the appearance of little white points. The shell is glossy" (Nehrkorn MS.). Cf. also, Hume *14*.

Nest. A hollow scraped in the ground, usually more or less lined with leaves, grasses, etc. *(14)*.

Distribution. India (Jerdon *1*, Hume *14*, etc.); Burmah (Oates *8*, etc.); Tenasserim (Davison *4*, *e 1*, Bingham *e 1*); Cochin China (David & Oust. *3*, Pierre *e 1*); Siam (Oates *8*); Hainan (D. & O. *3*, Styan *17*); Malay Peninsula (Maingay, Cantor *e 1*, etc.); Sumatra (Beccari *6*, Klaesi *10*, etc.); Java (Horsfield *d 2*, Vorderman *d 14*, *d 15*); Lombok (Doherty, Everett *e 3*); Philippine Islands (Tweeddale *d 12*, Steere *d 18*, B. & W. *e 2*), with Palawan (Whitehead *d 16*, *d 17*, Platen *d 16*); Balabac (Steere *d 16*); Sooloo (Guillem. *d 13*); Bongao (Everett *d 19*); Siao (Meyer *d XI*^{bis}); Celebes — Minahassa (Meyer *d 11*, P. & F. Sarasin); Gorontalo Distr. (v. Rosenb. *d 10*, Meyer *d 11*); Posso (Meyer *d 11*); Togian (Meyer *d 11*); Kandari, S. E. Celebes (Beccari *2*); Luwu Distr. (Weber *18*); Macassar (Wallace *d 9*); Bulekomba (Everett *e 3*).

Not much has been recorded about the Jungle Fowl in Celebes, where it must have been introduced by man. It is common at Kandari, where Beccari observed that it interbred with domestic fowls from which it may have sprung. In North Celebes Meyer found that the natives keep the Jungle Fowl in captivity, decoying it with trained domestic fowls. Curiously enough, the Jungle Fowl has not yet been recorded from Borneo. In a tame or feral condition it is found throughout Polynesia, where it has of course been introduced, and under

numerous artificial races it is a commodity of man in all quarters, or almost all. The investigations of Darwin *(d 8)* leave little doubt that *G. ferrugineus* is the ancestor of all domestic races of Fowl; his conclusions show the domestic forms seem to be perfectly fertile with *G. ferrugineus*, but they are more or less sterile when crossed with the three other known wild races; and domestic races, when crossed *inter se*, frequently revert sometimes slightly, sometimes strongly to a *Gallus ferrugineus*-type of plumage. The voice of the Wild Cock is like that of the ordinary domestic bird, but the terminal note is shorter. Some authorities state that the Wild Fowl is monogamous in the breeding-season, others believe it to be polygamous; Mr. Hume holds it to be "not always polygamous", but of unsettled habits in this respect. It is sociable, sometimes almost gregarious, frequenting all sorts of localities, though perhaps preferring, in Mr. Oates' opinion, broken ground and ravines with dense vegetation.

Gallus lafayettei Less. of Ceylon is easily distinguished from *G. ferrugineus* by its red breast, from *G. sonnerati*, India, by its hackles spangled with white or reddish round spots and grey-streaked under-parts, from *G. varius* (Shaw & Nodd.) of Java, Lombok and Flores by its single dewlap-like wattle, unserrated edge of comb, and many differences of coloration.

The *Phasianidae* are notable for their general absence in Celebes. Not counting *Gallus ferrugineus*, which may — we think must — have been introduced and become feral, the only member of the family found there is the little *Excalfactoria chinensis*, a species of wandering habits in some parts. Pheasant-forms abound as far as Java and Borneo, the latter separated from South Celebes only by a shallow sea. The following is a list of the genera of Java and Borneo compiled after Mr. Ogilvie-Grant's Catalogue:

Name of genus	Himalayas	Indo-China	Malay Peninsula	Sumatra	Java	Borneo	Philippines	Elsewhere
Rhizothera	.	.	*	*	.	*		
Arboricola	*	*	*	*	*	*	?	
Haematortyx	.	.	.	.	.	*		
Caloperdix	.	.	*	*	*	*		
Rollulus	.	.	*	*	*	*		
Melanoperdix	.	.	*	*	.	*		
Excalfactoria	*	*	*	*	*	*	*	*
Acomus	.	.	*	*	.	*		
Lophura	.	*	*	*	.	*		
Lobiophasis	.	.	.	.	.	*		
Gallus	*	*	*	*	*	*	*	
Polyplectron	.	.	*	*	.	*	?	
Argusianus	.	*	*	*	.	*		
Pavo	*	*	*	?	*			

Game-birds are heavy of body, and their flight, though swift, appears to be an exhausting exercise to them; it is inconceivable in some cases (e. g. *Gallus*) that they could fly across the 70 or more miles of the Macassar Strait, in other cases it is unlikely that they could do so. That none of the heavy-flying *Phasianidae* have succeeded in crossing is proof that Celebes has not been in land-contact with Borneo since the *Phasianidae* made their appearance in the latter country; and, if Celebes was in touch with Borneo and the continent when she received the *Babirusa*, the *Anoa* and the *Baboon* into her fauna, then this invasion of the mammals took place at a date before Pheasants were in Borneo — perhaps before they had developed at all. On the other hand it is possible that Pheasants once existed on Celebes and have become extinct. Should a Pheasant still be discovered there — a thing which is hardly to be expected — it would probably belong to a very peculiar type, one that came in with the *Babirusa* and *Anoa* and has shared a long period of isolation with them, during which it will have undergone considerable modification of structure and plumage.

FAMILY MEGAPODIDAE.

The Megapodes belong to the *Galline* suborder *Alectoropodes* in virtue of the hind toe being on a level with the other toes. They are the only birds which have the habit of burying their eggs and leaving them to be hatched by the heat of the sun, or of decaying vegetable-matter intermixed with the soil or sand heaped up by the parents, or, as occasionally happens in the case of *Megacephalon*, hot-springs are made to serve the same purpose. Where it has been possible to make the observation, the young bird has been found to be capable of flight on issuing from the egg.

In size the Megapodes vary from that of a Partridge to that of a large Fowl. The claws are large and but little curved, the hind toe is nearly as long as the lateral toes. Wing moderately large, but blunt, the secondaries falling short of the tip of the wing by about $^1/_8$ of its length. Sexes similar. The family is Australasian, but extends also to the Philippines, as well the Marianne and Pelew Islands, and Niuafou in Polynesia.

GENUS MEGAPODIUS Q. G.

Tail of 12 feathers, scarcely longer than the tarsus; tarsus anteriorly scutellated, naked; claws very long; the middle toe but little longer than the lateral ones; culmen shorter than the cranium, nostril oval, formed of a coriaceous membrane.

These birds generally, if not always, scrape together a mound of rubbish — often of enormous size — in which to bury their eggs. They wear a plain plumage of brown or grey, sometimes with most of head and neck bare.

287. MEGAPODIUS CUMINGI Dillw.

Little Moleo.

Plate XLI.

In uniting as one species *M. cumingi* Dillw. of Labuan, *M. lowi* Sharpe of Labuan, *M. pusillus* Tweedd. of Cebu, *M. dillwyni* Tweedd. of "the Philippines", and *M. gilberti* Gray of Celebes in the Catalogue of the Game Birds Mr. Ogilvie-Grant seems to us to have made a step in the right direction; generally speaking the birds are similar, and it is most probable that with a sufficiently large material from all quarters the gaps which seem to separate the typical individuals may be filled up. But the bird varies locally in many different localities, and Mr. Grant's work would have been still more welcome, if he had drawn attention to some of these racial departures. In Mindanao the bird appears to be about twice as a big as it is in North Borneo; another difference is seen in Celebes specimens, to which the following are some of the principle references:

a. **Megapodius** *(1)* Wall., Ibis 1860, 142; *(2)* id., Malay Archip. 1869, I, 413.

b. **Megapodius gilberti** (and **gilbertii**) *(1)* Gray, P. Z. S. 1861, 289; *(2)* Schl., Ned. Tdschr. Dierk. 1866, III, 263, pt.; *(3)* Wald., Tr. Z. S. 1872, VIII, 87; *(4)* Rosenb., Malay. Archip. 1878, 276; *(5)* Meyer, Ibis 1879, 138, 146; *(6)* Schl., Mus. P.-B., Megapod., 1880, 73; *(7)* Oustal., Mon. Megap. 1881, 107; *(8)* Guillem., P. Z. S. 1885, 557; *(9)* Hickson, Nat. in N. Celebes 1889, 94.

c. **Megapodius freycineti** *(1)* Rchb., Tauben 1862, 5, pt. (Manado); *(2)* Joest (nec Q. & G.), Das Holontalo 1883, 106.

Megapodius cumingi *(1)* Grant, Cat. B. 1893, XXII, 449; *(2)* M. & Wg., Abh. Mus. Dresd. 1895, Mai, Nr. 8, p. 16; *(3)* Hart., Nov. Zool. 1896, 166.

"Moleo kitjil" (kitjil = little), Malay, N. Celebes, Meyer *b 5.*

"Panoa", v. Rosenb. *b 4*, or **"Panua"**, Joest *c 2*, Gorontalo Distr.

"Moleo utang", Lembeh Id., Nat. Coll.

For further references cf. Oustalet *b 7.*

Descriptions. Gray *b 1*; Schlegel *b 6*; Oustalet *b 7*; Grant *1.*

Adult. Above warm olivaceous brown, head, nape and fore-neck washed with slate-grey; all the under-parts brownish slate-grey: "bare skin of the face fine bright red; bill brown, above blackish; iris brown (difficult to determine); legs and feet in front and above black, behind reddish, below yellowish" — P. & F. Sarasin (♂, Rurukan, 26. III. 94).

Sexes. Appear to be perfectly similar in coloration.

Immature. A specimen which we consider scarcely adult differs in having the crown and under-parts olivaceous with very little of the slate-grey tint of the adults (♂, Kema, 25. VIII. 93: Sarasin Coll.).

Chick. "Head and nape olive-brownish; mantle, back, uropygium, and wing-coverts irregularly banded with brownish red; chin yellowish; throat olive-brownish, breast and belly somewhat lighter, and shading into red-brown; wings greyish brown; bill dark horn-colour; feet black" (Meyer *b 5*).

It appears certain that the chick of this Megapode can fly as soon as it is hatched, like that of *Tagegallus* and *Megacephalon.*

Measurements.	Wing	Tail	Tarsus	Bill from nostril
a. (Nr. 10538) ad., Manado (v. Schierbr.)	205	65	58	12
b. (Nr. 12985) ad., Gorontalo (Riedel)	215	71	60	11
c. (Nr. 12912) ♂ ad., Togian, Aug. 71 (Meyer) . . .	195	65	57	—
d. (Sarasin Coll.) ♂ ad., Tomohon, 17. IV. 94 . . .	200	68	59	11.5
e. (Sarasin Coll.) ♂ ad., Rurukan, 26. III. 94 . . .	210	70	61	11.5
f. (Sarasin Coll.) ♀ ad., Kema, 29. VIII. 93	210	66	61	11
g. (Sarasin Coll.) ♂ vix ad., Kema, 25. VIII. 93 . .	195	62	59	12
h. (C 14146) ad., Lembeh Id., Febr. 1895 (Nat. Coll.) .	208	66	62	13
i. (C 14147) ad., Lembeh Id., Mch. 1895 (Nat. Coll.) .	215	66	—	13
j. (Nr. 12916) ♂ ad., Mindanao, Dec. 75 (Laglaize) .	245	77	65	—
k. (Nr. 12915) ♀ ad., Mindanao, Dec. 75 (Laglaize) .	245	75	62	13
l. (Nr. 12914) ad., Sandakan, N. Borneo (Pryer) . . .	210	62	53	12.5

Skeleton (from Meyer, Vogelskel. II, 1894, t. CLXXXI: N. W. Borneo).

Length of cranium . . .	55.0 mm	Length of tarso-metatarsus.	63.0 mm
Greatest breadth of cranium	23.3 »	Length of digitus I . . .	34.7 »
Length of humerus . . .	71.3 »	Length of digitus II . . .	44.4 »
Length of ulna	77.3 »	Length of digitus III . .	50.0 »
Length of radius	71.3 »	Length of digitus IV . .	44.6 »
Length of manus	62.0 »	Length of sternum . . .	77.0 »
Length of metacarpus . .	36.3 »	Greatest breadth of sternum	41.0 »
Length of digitus I . . .	14.3 »	Height of crista sterni . .	32.5 »
Length of digitus II . . .	25.4 »	Length of coracoideum . .	47.0 »
Length of digitus III . .	7.7 »	Length of scapula	61.5 »
Length of femur	64.0 »	Length of clavicula . . .	52.0 »
Length of tibia	93.0 »	Length of pelvis	90.0 »
Length of fibula	52.0 »	Greatest breadth of pelvis .	44.5 »

Egg. Long oval, the ends equal; very light clay-colour; shell thick, rather rough, glossless: size 79 × 49.5 mm (1 ex. Minahassa: Sarasin Coll.).

Nest. A huge mound of rubbish in which the eggs are buried deeply (see below).

Distribution. Labuan (type of *C. cumingi*, Mottley); Kuraman (Everett); Tega Islands (Whitehead); Mantanani Islands (Everett); N. Borneo — Sandakan (Pryer); Balabac (Steere); Palawan (Lemprière, Whitehead, Platen); Luzon (Cuming, Maitland-Heriot); Cebu (Everett); Masbate and Marinduque (Steere); Mindoro (Schadenberg Mus. Dr.); Mindanao (Everett, Steere); Basilan (Everett, Steere); Sooloo (Platen); Sibutu (Everett). — Authorities: Everett, J. Str. Br. R. A. S. 1889, 197; Grant *1*; Tweeddale, Orn. Works; Steere, List B. and M. Philipp. Is. 1890, 25; Sharpe, Ibis 1894, 242, 257.

North Celebes: — Minahassa (Wallace *a 1*, *1*, v. Musschenbr. *b 6*, etc.); Talissi Id. (Hickson *b 9*); Tendila Id. (Nat. Coll. *b 9*); Lembeh Id. (Nat. Coll.); Gorontalo Distr. (Rosenb. *b 4*, *b 6*, Meyer *b 5*); Togian (Meyer *b 5*); West Celebes (Doherty *3*).

Like *Calornis panayensis* and some other forms inhabiting the Philippines, this Megapode is known in the Celebesian subregion only from North Celebes and the islands off the coast, though it is to be anticipated that further research will prove its distribution in the island to be greater. From its almost complete

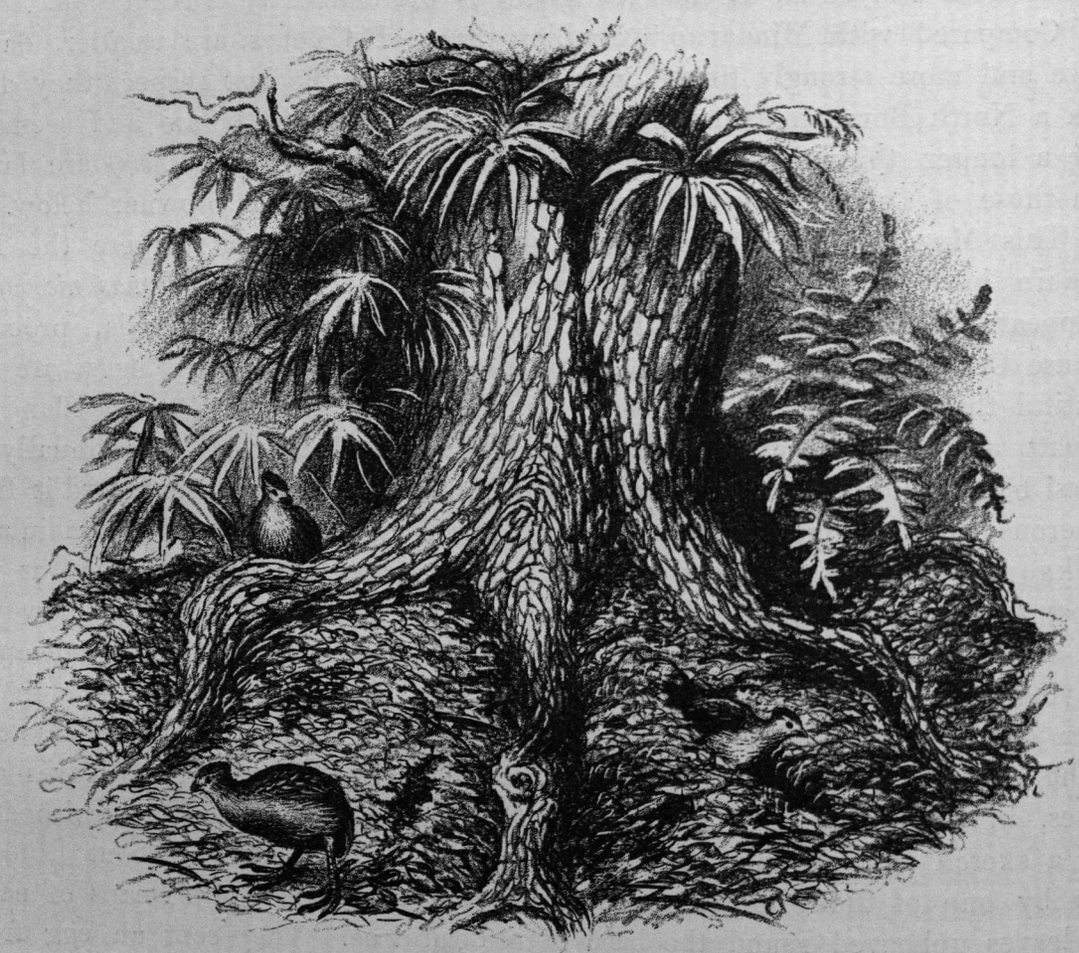
identity with Philippine birds and close affinity with the Sangi, Sula, Tenimber and Nicobar races, it may be assumed that the Celebesian bird is either a recent addition to the island, or that it has recently colonised the other islands from Celebes. Mr. Ogilvie-Grant distinguishes these Megapodes by their not having the mantle grey, but olive-brown or rufous brown, like the rest of the back. The grey-mantled species — about five in number — range from the Moluccas and Lombok to New Guinea, the Solomons and Northern Australia; all other species (which have a blackish grey upper surface) belong to Papuasia, the Moluccas, or Polynesia, so that the genus is pre-eminently Australasian.

Compared with Mindanao examples those of Celebes are smaller, darker above and more strongly tinged with grey below; in the last respect they differ from a North Bornean example, which is much browner below and seems to have a longer, thinner bill. Sangi and Talaut birds *(M. sangirensis)* are larger than those of Celebes, much darker above, and darker and browner below.

This Megapode is rather a rare bird in the Minahassa, where the Drs. Sarasin have met with most success in finding it. Like *Caloenas nicobarica*, it appears to be more plentiful on the neighbouring small islands, probably because Crocodiles, Lizards, and Mammals, which destroy their eggs, are less plentiful there. Thus, Meyer found it fairly abundant on a small island off Paguatt, and obtained it on Togian Island; Hickson observed it continually on Talissi Island and records it from Tendila Island; other naturalists record it from numerous small islands near N. Borneo, but Pryer only from the mainland. Hickson says it is very fond of the bamboo woods of Talissi, where it was almost always to be seen or heard in a quarter of a mile's walk; it is, however, very shy and difficult to shoot. It "lays its eggs in the forest under a heap of decaying leaves". Mr. Wallace *(a 1)* says that it scratches out a hole in the rotten stump or root of a fallen tree, there burying its eggs. Meyer was told by the natives that it constructs a mound about two feet high of leaves and bushes, in which the eggs are buried. Drs. Sarasin have kindly furnished us with a sketch of a nesting place of this species near Tomohon, about 1200 m, done by one of their hunters (reproduced p. 674). There were heaps of earth and leaves upheaved round the base of a dead tree. They sent an egg from there (3. VI. 1894). The best account of the breeding of this species is given by Whitehead (Ibis 1888, 411), whose remarks relate to the small islands near Borneo, and to Palawan: "Their nest is a most wonderful structure, and is no doubt built by the labour of several pairs of birds. A Sulu boy caught seven or eight birds on one heap. The largest nest I have seen was 34 paces round and $5^1/_2$ feet high, and the heap must have contained many cartloads of earth, sticks, and stones, and yet the ground round about was apparently untouched. How such a heap is brought together is a mystery; but it is no doubt the gradual work of many birds for several years; for the birds, if not molested, use the same heap many seasons. The eggs are often buried so deep that with our small implements (a cocoa-nut shell) we found it impossible to get at them. The

eggs are often placed among the roots of a tree, and this makes them very difficult to get at. A good many leaves are plucked and placed in the hole, and amongst these the egg is laid. The leaves would ferment and so assist in hatching the eggs, which are of a pale salmon-colour with a chalky surface, which is easily chipped off."

"The young birds' early life is to me a mystery. It may be dug out of the heap fully fledged and ready to fly . . . The young are neither fed nor looked after by their parents, which, as they are of all ages, would be difficult.



They generally squat until you are within 15 yards or so and then take wing like a Quail, never running out of danger like the old birds".

There is a great charm in the idea of thus awaking into life, as capable of enjoying it as a child of ten! Prof. W. Blasius has stated (in a lecture) that he once was watching an egg of the allied *Talegallus*-Hen; presently it cracked, and out came a chick, which flew straight up on to a perch; and the observation has been made by other naturalists on that species (Gld., HB. B. Austr. 1865, II, 153). Mr. Wallace records a very similar observation on the Moleo, and Dr. Studer on *M. freycineti* (Reise Gazelle 1889, III, 253), and we believe the same condition will be found to exist in most Megapodes. The

accounts of the nesting-habits of the Celebes Megapode, as recorded by Wallace, Hickson, and Meyer, differ somewhat among themselves and from Mr. John Whitehead's personal observations, yet it is not unlikely that all are correct. Megapodes show great sagacity in their choice of a nesting-place, modifying their habits where advisable, as shown by a striking instance discovered by Drs. P. & F. Sarasin in the case of the Moleo (see that species below).

* 288. MEGAPODIUS SANGIRENSIS Schl.

Sangi Megapode.

Plate XLI.

a. **Megapodius gilberti**, partim *(1)* Schl., Ned. Tdschr. 1866, III, 263 (Siao); *(2)* Meyer, Ibis 1879, 139.

Megapodius sanghirensis *(1)* Schl., Notes Leyden Mus. 1880, II, 91; *(2)* id., Mus. P.-B., Megapod., 1880, 73; *(3)* Oustal., Ann. Sc. Nat. 1881, XI, 110; *(4)* Meyer, Isis, Dresden 1884, 6; *(5)* W. Blas., Ornis 1888, 626, 642; *(6)* Hickson, Nat. in N. Celebes 1889, 95; *(7)* Grant, Cat. B. 1893, XXII, 450; *(8)* M. & Wg., J. f. O. 1894, 238, 251; *(9)* iid., Abh. Mus. Dresd. 1895, Nr. 9, p. 8.

b. **Maleo** *(1)* Hickson, Nat. in N. Cel. 1889, 41.

"Keoo", Tagulandang and Ruang; Nat. Coll.

"Eoa", Kabruang; **"Keo"**, Karkellang; iid.

Descriptions. Schlegel *1*, *2*; Oustalet *3*, Grant *7*.

Diagnosis. Like *M. cumingi* of Celebes, but larger, dusky olivaceous brown above, not bright olivaceous brown, dusky slaty-brown below.

The bird may be termed a large and dusky edition of *M. cumingi*.

Distribution. Sangi and Talaut Islands, but in these two groups further local differences can be seen:

(1) Size smaller: Great Sangi (Hoedt *2*, Meyer *4*); Siao (v. Duivenb. *2*); Tagulandang and Ruang (Hickson *6*, *b 1*, Nat. Coll.).

(2) Size larger: Kabruang and Karkellang, Talaut (Nat. Coll.).

Measurements.	Wing	Tarsus	Bill from nostril
a. (C 13098) [♂] ad., Kabruang, Nov. 93 (Nat. Coll.). . . .	245	69	13.5
b. (C 13099) [♀] ad., Kabruang, Nov. 93 (Nat. Coll.). . . .	255	—	13
c. (Tring Mus.) [♂] ad., Kabruang, Nov. 93 (Nat. Coll.) . .	245	68	—
d. (Tring Mus.) [♀] ad., Kabruang, Nov. 93 (Nat. Coll.) . .	248	65	—
e. (Tring Mus.) [♀) ad., Karkellang, 16. Nov. 94 (Nat. Coll.) .	247	73	12.5
f. (C 15421) ad., Karkellang, autumn 1896 (Nat. Coll.) . . .	252	67	14
g. (C 15423) ad., Karkellang, 26. Aug. 1896 (Nat. Coll.) . .	237	73	13.5
h. (C 15419) ad., Karkellang, autumn 1896 (Nat. Coll.) . . .	244	72	14
i. (C 15422) ad., Karkellang, autumn 1896 (Nat. Coll.) . . .	251	66	14
j. (Nr. 12911) ad., Great Sangi (Meyer)	230	66	12
k. (C 13484) ad., Tagulandang, Aug. 94 (Nat. Coll.)	230	—	12
l. (C 13485) ad., Tagulandang, Aug. 94 (Nat. Coll.)	240	64	13
m. (C 13486) ad., Ruang, Aug. 94 (Nat. Coll.)	235	65	12.5
n. (C 13487) ad., Ruang, Aug. 94 (Nat. Coll.)	227	65	11.5
o. (C 13488) ad., Ruang, Aug. 94 (Nat. Coll.)	235	64	12.5

Egg. Similar to that of *M. cumingi*: 81 × 48, 77 × 48.7, 78 × 48 mm (Karkellang, Nov. Nat. Coll.)

Megapodes appear to be much more common in Sangi and Talaut than on the mainland of Celebes, and they follow the rule in showing an increase in size. On Ruang, which is merely a volcano rising from the sea close to Tagulandang, Dr. Hickson says: "The maleos seemed to be here quite tame, for they would calmly watch us from the branches of the trees until we got within thirty or forty yards of them, and then only, slowly and clumsily flew on a few yards further". As already mentioned, *M. cumingi* also seems to thrive better on small islands than on the adjacent mainland.

Of the 9 specimens collected by our native hunters in Kabruang and Karkellang 7 have the head feathered above, the other two bald, with a stripe of the feathers down the middle; the latter are marked by the hunters as males, 3 of the former as females, and it may possibly be a seasonal difference of a sexual nature. 14 further specimens arrived from Karkellang in 1897.

* 289. MEGAPODIUS BERNSTEINI Schl.

Sula Megapode.

Megapodius bensteini *(1)* Schl., Ned. Tdschr. Dierk. 1866, III, 251, 261; *(2)* Gray, HL. II, 1870, 255; *(3)* Schl., Mus. P.-B., Megapod., 1880, 63; *(4)* Oustal., Ann. Sc. Nat. 1881, XI, 137; *(5)* Grant, Cat. B. 1893, XXII, 450.

Descriptions. Schlegel *1, 3*; Oustalet *4*; Grant *5*.

Diagnosis. Resembles *M. cumingi* of Celebes, but differs by its reddish feet (not black), by the clear brown-reddish of its plumage (darker and duller in the Celebes bird), the under-parts, sides of head and hind neck blackish grey (Schlegel *1*).

Measurements. Wing 179—212 mm; tail 60—73; bill 14—16; tarsus 52—59; middle toe 41 (Oustalet *4*).

Distribution. Sula Islands: Sula Mangoli (Bernstein *3*, Hoedt *3*), Sula Besi (Hoedt *3*, Teijsmann *3*).

In his treatment of the Megapodes the great German ornithologist at Leyden, Schlegel, made a curious departure from his usual plan of allowing only strikingly characterised forms to rank as species, some of the differences between the Megapode species admitted by him being very slight. This step may have been due to the consideration that the Megapodes are stationary and locally isolated from another, under which condition racial differences arise. All of the species admitted by Schlegel are accounted valid by Dr. Oustalet in his "Monographie des Mégapodiidés".

The Sulan bird seems to be easily distinguishable. Schlegel grouped the Megapodes into two subdivisions according to their having pale or blackish feet, and *M. bernsteini* belongs to the former group, the Celebesian and Sangi species to the other.

290. MEGAPODIUS DUPERREYI Less. Garn.

Orange-legged Megapode.

Megapodius duperreyi (or **duperreyii**, or **duperrei**) *(1)* Less. & Garn., Bull. Sc. Nat. 1826, VIII, 113; *(II)* Less., Voy. Coqu. Zool. 1828, I, pt. II, 700, pl. 36; *(3)* Schl., Mus. P.-B., Megapod., 1880, 57; *(4)* Oustal., Ann. Sc. Nat. 1881, XI, 77—95; *(5)* Salvad., Orn. Pap. III, 1882, 219; Agg. 1891, 194; *(6)* Vorderm., N. T. Ned. Ind. 1890, L, 520; *(7)* Grant, Cat. B. 1893, XXII, 454; *(8)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 16; *(9)* Hart., Nov. Zool. 1896, 181, 574, 598.

a. **Megapodius rubripes** *(I)* Temm., Pl. Col. 411 (1826); *(2)* H. E. D. Engelhard, Bijdr. Taal-, Land- en Volkenkunde Ned. Ind. 4 ser. VIII, 1884, 280.

b. **Megapodius tumulus** Gld.; *(I)* id., B. Austr. V, pl. 79 (1842); *(II)* Gray, P. Z. S. 1861, 290, pl. XXXIV (juv.); *(3)* Gld., HB. B. Austr. 1865, II, 167; *(IV)* Diggl., B. Austr. II, pl. 94 (1877).

c. **Megapodius gouldii** *(1)* Gray, P. Z. S. 1861, 290.

"Bumbungang", Saleyer Islands, Engelhard *a 2*.

For further synonymy cf. Oustalet *4*; Salvadori *5*; Grant *7*.

Figures and descriptions. Gould *b I* (Austr.); Gray *b II* (Austr.); Diggles *b IV* (Austr.); Lesson *II* (New Guinea); Temminck *a I* (Lombok — fide Schl.); Oustalet *4*; Salvad. *5*; Grant *7*.

Adult. Like *M. cumingi* of Celebes, but the feathers of the head lengthened on the occiput so as to form a tuft; mantle and neck brownish slate-grey, like the under surface; legs and feet orange, not blackish; tail longer (Sumba: Riedel — Nr. 12917).

Measurements. Wing from 215 mm (Lombok) to 282 (Queensland); tail 80—135; bill 17—19; tarsus 48—66; middle toe 30—43 (Oustalet *4*).

Immature birds. "Are easily recognised by their sharp-pointed outer primaries" (Grant *7*).

Young. "In quite young specimens the chin and throat are buff, shading into grey on the neck, and into pale rufous-brown on the rest of the under-parts" (Grant *7*).

Eggs. Long ovals, cream-buff to clay-buff: 85 × 52 mm and 83 × 50 mm (Bonerate: P. & F. Sarasin). Elongated ovals, pale coffee-brown: size c. 90 × 52 mm (Australia: North, Nests & Eggs 1889, 282). Tint often as in Cochin China fowl: 88 × 52 mm (Kangean Is. near Java: Vorderman *6*).

Nest. A Megapode-mound (see *M. cumingi*).

Distribution. Celebes subregion: — Saleyer Island (Teijsmann *3*), Kalao and neighbouring islets (Engelhard *a 2*), Bonerate (P. & F. Sarasin *8*), Djampea and Kalao (Everett *9*); Kangean and Lombok, Sumba, Flores, to Banda, the Western Papuasian Islands, New Guinea, North Australia and North Queensland (Salvadori *5*, Grant *7*, etc.).

This species is included in the avifauna of the Celebesian area in virtue of four specimens obtained in the Island of Saleyer by Teijsmann in 1877, and others obtained by Mr. Everett in Kalao and Djampea. Teijsmann's examples are stated by Schlegel to be absolutely similar to individuals from Lombok, Wetter, Banda etc., but the feathers of the mantle, as well as the greater wing-coverts are partly tinted with straw-yellow towards their tips. Mr. Hartert points out no definite differences. Mr. Engelhard *(a 2)* says that it lives in the islands of the Bonerate subdistrict (south of Saleyer) in great numbers, especially in Kalao, or Lambego, where it is held in honour and

has become peculiarly tame. The Sarasins procured two eggs in the market at Bonerate.

We follow Dr. Oustalet and Mr. Ogilvie-Grant in uniting the Lesser Sundan and the Australian forms with that of Papuasia, though it should be pointed out that Count Salvadori holds (or held) the last for a species by itself. After investigating the materials in the British, Leyden and Paris Museums, Dr. Oustalet came to the conclusion that there are no constant relations between the place of origin of these birds and their size and shades of colour. Local extremes of variation appear, however, to occur in the Lesser Sunda Islands and in Australia, the former being on an average smaller and, according to Mr. Ogilvie-Grant, more lightly coloured. It is to these that the name *rubripes* belongs, the type of Temminck's species having been obtained, as Schlegel *(3)* makes evident, by Reinwardt in Lombok.

The habits of this species in Australia and the islands off Cape York are well described by Gilbert and Macgillivray in Gould's "Birds of Australia"; Dr. Vorderman also records some notes on its habits in the Kangean Islands, which may be referred to (N. T. Ned. Ind. XLIX 1889, 71).

GENUS MEGACEPHALON Temm.

The Moleo, the only member of this genus, is of the size of a large Fowl. Head bare, neck almost bare; the head furnished with a large black occipital casque or knob; a small knob behind each nostril, which is large and nearly round; tarsus rather long, naked, reticulated in front and behind with small hexagonal scales; toes webbed at the base to about the first joint of the lateral ones; tail about twice as long as the tarsus, of 18 rectrices, bilaterally pressed together somewhat, or "gabled"; wing very blunt, the secondaries a little shorter than the longer primaries.

* 291. MEGACEPHALON MALEO (Hartl.).

Moleo.

a. **Maleo** *(1)* Temm. in text to Pl. Col., Megapodius, 1826; *(2)* Reinw., Reis. Ind. Archip. in 1821, 591 (1858).

b. **Megapodius rubripes** *(1)* Quoy & Gaim. (nec Temm.), Voy. Astrol. Zool. 1830, I, 239, pl. 25 (= juv.).

Megacephalon maleo "Temm." *(1)* Hartl., Verzeichniss 1844, 101; *(2)* Temm., Coup d'Oeil génér. Possess. Néerl. 1849, III, 116; *(3)* Gray, List Gen. & Subgen. B. 1855, 103; *(4)* Bp., Compt. Rend. 1856, XLII, 876; *(5)* Schl., Handl. Dierk. 1857, 389; *(6)* Wall., Ibis 1860, 142; *(7)* id., P. Z. S. 1863, 34; *(VIII)* Schl., Dierent. 1864, 114, fig. 215; *(9)* Finsch, Neu Guinea 1865, 180; *(10)* Gray, List Gall. Br. Mus. 1867, 18; *(11)* id., HL. II, 1870, 254, Nr. 9538; *(12)* Sclat., P. Z. S. 1871, 700; *(13)* Sundev., Tentamen 1872, 118; *(14)* Walden, Tr. Z. S. 1872, VIII, 87; *(15)* Garrod, P. Z. S. 1873, 469, 640; *(16)* Salvad., Ann. Mus. Civ. Gen. 1875,

VII, 673; *(17)* Cab., J. f. O. 1875, 121; *(18)* Garrod, P. Z. S. 1875, 343; *(19)* Brügg., Abh. Ver. Bremen 1876, V, 88; *(20)* Garrod, P. Z. S. 1878, 629; *(21)* Rosenb., Malay. Archip. 1878, 276; *(22)* Meyer, Ibis 1879, 139; *(23)* Giebel, Ztschr. ges. Naturw. 1880, (3) XV, 207; *(24)* Schl., Mus. P.-B., Megap., 1880, 77; *(XXV)* Oust., Ann. Sc. Nat. 1880, X, 16, 19, 23, pl. 20, 21 (skel.); 1881, XI, 2; *(26)* W. Blas., J. f. O. 1883, 139; *(27)* Meyer, Isis, Dresden 1884, 6, 53; *(28)* Guillem., P. Z. S. 1885, 559; *(XXIX)* id., Cruise "Marchesa" 1886, II, 194 et sequ., fig.; *(30)* Platen, Gefied. Welt 1887, 219; *(31)* W. Blas., Ornis 1888, 627, 642; *(32)* Hickson, Nat. in N. Celebes 1889, 95; *(33)* Tristr., Cat. Coll. B. 1889, 30; *(34)* Hart., Kat. Vog. Senck. Mus. 1891, 200; *(35)* Grant, Cat. Birds. 1893, XXII, 472; *(36)* Newton, Dict. B. pt. II, 1893, 541; *(37)* P. & F. Sarasin, Z. Erdk. Berlin 1894, 375, 388, 396 398; *(38)* M. & Wg., Abh. Mus. Dr. 1895 Nr. 8, p. 16; *(39)* iid., ib. 1896, Nr. 1, p. 6.

c. **Megapodius (Macrocephaloma) maleo** *(I)* Thienem., Fortpfl. Vög. 1845—54, I, 11, pl. IV, 1.

d. **Megacephalon rubripes** *(I)* Gray, Gen. B. III, 489, pl. 123 (1846— here *rufipes*); *(2)* id., P. Z. S. 1861, 288; *(3)* Schl., Ned. Tdschr. Dierk. 1866, III, 259; *(4)* Wall., Malay Archip. 1869, I, 413.

e. **Macrocephalon maleo** *(1)* S. Müll., Arch. f. Nat. 1846, XII, pt. I, 116.

f **Megapodius maleo** *(I)* Schl., Handl. Dierk. 1857, I, 384, 480, pl. V, fig. 63.[1])

g. **Megacephala maleo** *(1)* Heine & Rchw., Nomencl. Mus. Hein. 1890, 303.

"Maleo", Malay, N. Celebes, Reinwardt *a 2*, Wallace *d 4*, v. Rosenb. *21*, Hickson *32*.

"Moleo", Meyer *22*, Joest, Das Holontalo 1883, 105, Nat. Coll.

"Mumunga", Tondano neighbourhood, Meyer *22* (cf. Mamunga in Tagulandang, Hicks. *32*).

"Sankawor", Minahassa, Nat. Coll.

"Moleo besar" (= Great Moleo), Lembeh, iid.

Remark. The name Maleo or Moleo is used as well for *M. cumingi*, this one being the Little Moleo, Moleo kitjil. Rosenberg gives the name of *M. freycineti* in Ternate as "Maleo" (Salvad., O. P. III, 231). In the New Hebrides one of the names of *M. layardi* is "Malou", according to Layard; and the geographically isolated *M. pritchardi* of Niuafou in Polynesia is called "Mallow" or "Malau". *Lipoa ocellata* of Australia, according to Newton *(36)* is commonly known in England as the "Mallee-Bird". In New Caledonia the expression for bird is mali, and "man" is found all over the South Seas for "bird", therefore in the word maleo or moleo the root mal = man is no doubt contained.

Figures and descriptions. Gray *d I*; Quoy & Gaim. *b I* (juv.); Schlegel *f I, VIII, 5, 24*; Guillem. *XXIX* (woodcut); Oustalet *XXV* (skeleton, descr.); Brügg. *19*; Grant *35*.

Adult. Blackish brown with greenish gloss in certain lights; tail quite black; breast, sides and abdomen white, with a strong salmon-colour tint in life and fresh skins; head naked, with a large occipital knob or casque: "casque black; bill at the base of the upper mandible reddish brown, of the under mandible and the middle of the upper mandible black, point of bill yellowish; skin of the neck blackish; round the eyes of a fleshy yellowish colour; legs bluish black; feet and claws yellowish" — Meyer *22*; "iris brown" — Guillem. *28* (ad., Kema, Aug.: P. & F. Sarasin).

Sexes. Alike in coloration: the male is slightly the larger, generally has a some-what larger casque and is a little brighter (Guillem. *28*).

Chicken. Above bistre, head somewhat varied with buffish; wings blackish; fore-neck like the back; forehead, chin, throat, and remaining under-parts light cinnamon-buff;

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[1]) In an out-of-the-way place P. Leverkühn (Fremde Eier im Nest 1891, 38—45) has reprinted from Oustalet and others a synonymy of the *Megapodidae*; we have not quoted this compilation here and *antea*.

rectrices not yet developed; remiges large and powerful (♂, not more than two or three days old, Kema, 12. Nov. 93: P. & F. Sarasin). The young are capable of flying on leaving the egg.

Measurements. Wing 308 mm; tail 175; tarsus 84, mid. toe with claw 70; bill from nostril 28.

Skeleton (from Oustalet *XXV*).

Length of cranium	100 mm	Length of humerus	83 mm
Greatest breadth of cranium.	25 »	Length of ulna	94 »
Length of sternum	95 »	Length of metacarpus . . .	49 »
Breadth of sternum (middle).	50 »	Length of digitus principalis.	30 »
Height of crista sterni. . .	37 »	Length of pelvis	104 »
Length of coracoideum. . .	64 »	Length of femur.	87 »
Length of clavicula	61 »	Length of tibia	128 »
Length of scapula	81 »	Length of metatarsus . . .	83 »

Eggs. "Dr. Platen sent me numerous eggs from the Minahassa and confirms what has been long known about the breeding-habits of the Megapodes. The eggs measure 100—104 × 60—61 mm and are flesh-colour, with darker clouds over the whole surface" (Nehrkorn MS.).

Remark. The unusually lengthy form of this and of other Megapodes' eggs appears to be a condition necessary to the great development of the remiges of the chick before leaving the egg.

Nest. A hole scratched three or four feet deep in the black volcanic sand of the sea-shore, afterwards covered in with about one, two, three or more feet of sand (Wallace *d 4*, Guillemard *28*); or, in the forests, in pit dug close to a hot-spring (P. & F. Sarasin — see also below).

Distribution. North Celebes: — Minahassa (Reinwardt *a 2*, Quoy & Gaimard *b I*, Wall. *6*, etc.); Cape Flesko (P. & F. Sarasin *37*, *38*); Gorontalo Distr. — Bone Valley (v. Rosenberg *21*, P. & F. Sarasin *37*, *38*); Bolontio (Meyer); Lembeh Id. (Nat. Coll.); Paguatt (v. Rosenberg *24*). Said to occur on Banka (Meyer); Sangi.[1])

The Moleo, which is known only from the Northern Peninsula of Celebes and some of the small islands in the north, is one of the most interesting and characteristic types of the country. It is the sole representative of the genus *Megacephalon*, distinguishing itself from the other Megapode genera by the large occipital casque and the two smaller knobs behind the nostrils with which the naked head of the bird is furnished; its tarsus, also, is reticulated in front for the upper two-thirds with small scales, and the feet are webbed at the base almost up to the first joint of the toes. The light under surface, which is richly tinted with salmon-colour in life — a colour which soon fades in skins — is also peculiar to the Moleo among the Megapodes. The forms with which it seems to have most affinity are *Talegallus* and *Aepypodius*, both of New Guinea and some of the islands to the west. The typical Megapodes of the genus *Megapodius* differ by their short tail of 12 feathers (in *Megacephalon* 18), their

[1]) Meyer's *(22, 27)* and Hickson's *(32)* statements, that the Moleo occurs on the Sangi Islands, is due to the fact, which has been ascertained on our suggestion by the Resident Jellesma of Manado, that birds were introduced there by a Rajah years ago and multiplied rapidly in consequence of its being unlawful to shoot them. But since this is no longer the case, the number has gradually decreased and now hardly any are found there.

small size, and their much longer claws. The Moleo also has some remarkable peculiarities in its breeding economy, about which much has been written by Wallace *(6, d 4)*, Rosenberg *(21)*, Meyer *(22)*, Guillemard *(29)*, and lastly by P. & F. Sarasin *(37)*.

Unlike the *Megapodius*, the *Megacephalon* does not raise a heap of rubbish in which to lay its eggs but sinks a pit in the sand which it afterwards fills in, burying its egg to a depth of about 1—3 feet. One of its favourite breeding grounds has been made known by Mr. Wallace in a spot on the north coast between the islands of Lembeh and Banka, to which Dr. Guillemard and his companious have given the name of Wallace Bay. Meyer has described it as "a large irregular bay, with black sand ... which did not consist of sand in the common term, but of small stones up to the size of a bean into which the foot sank up to the ankle". It seems to mark, as Mr. Wallace first observed, an ancient lava-stream of the Klabat Volcano, which has flowed down a valley into the sea, and become decomposed and triturated into loose black sand. Mr. Wallace continues: "In the mass of loose sand thrown up above high-water mark are seen numbers of holes four or five feet in diameter. In and around these holes, at a depth of one or two feet, the eggs of the Moleos are found. There are sometimes only one or two, sometimes as many as seven or eight in one hole, but placed each at a distance of 6—8 inches from the others". In the Bone valley Rosenberg noticed that the eggs stand on end upright in the sand in which they are laid. According to Wallace a number of females lay in the same hole, each egg being that of a different bird; but whether he makes this statement from personal observation, or after the assertions of the natives (which are utterly unreliable), or from finding many fresh eggs (many days appear to elapse between the deposit of the successive eggs) in the same hole, we are not told; like Dr. Guillemard, Mr. Wallace watched the birds at work in pairs, "choosing either a fresh place or an old hole", but it appears still to need confirmation, whether other pairs make use of the same hole. Owing to the continuous digging, the surface of the sand must needs always be changing in appearance — Guillemard compares it "to nothing better than the surface of a rough, confused sea" — and it is conceivable that it would be impossible for a female to rediscover the spot where it laid its first egg.

Although the Moleo is not known to take any further care for the egg or its product after the former has been laid in an upright position and covered in deeply with sand, this apparent lack of philoprogenitive affection so strongly developed in most birds is counterbalanced by the extraordinary forethought — if one may use the word — for the ultimate welfare of the young displayed by the parent-birds in selecting the places where their eggs and offspring will be left to their fate. The burying of the egg at a considerable depth answers two purposes — protection from egg-eating animals[1]), and the preservation

[1]) The eggs do not, however, always escape: Meyer shot a young crocodile 3 feet in length (*Crocodilus biporcatus*) busy digging for eggs in a Moleo-hole, and saw other crocodile-diggings.

for it of the needful heat of the sun absorbed during the day by which the eggs are kept from perishing in the cool of the night. Now black absorbs heat, while white reflects it, and this seems to be the reason why the birds have made a chief breeding-spot of the hot black volcanic sand of Wallace Bay. It is interesting to note that the black gravel on these shores alternates with white sand, as Meyer knows from personal observation, and that the Moleos only select the black as far as is known. A similar observation is made by Dr. Studer on *Megapodius freycineti* in New Britain: here the bird lays its eggs in black volcanic sand, the temperature of which registered 38° to 40°C. and cooled but little during the night, "as the black sand absorbs very much heat and emits little" (Reise der "Gazelle" 1889, III, 253; Z. wiss. Zool. 1878, 433). But a much more striking display of sagacity in the selection of breeding-spots by the Moleo is recorded by the cousins Drs. P. & F. Sarasin, whose words *(37)* we translate: In the Bone valley (ca. 250 m) the naturalists came across "a great number of pits, which Maleo-fowls had dug out in order to lay their eggs there. Our people made a search, and we secured to our satisfaction four new-laid eggs. In the same bamboo-thicket, exactly on the spot where the numerous Maleo-pits were scraped out, one against the other like Wolf-pits, was a warm spring . . . The temperature of the water must have been about 60°C . . . The circumstance, that here in the mountains, where the temperature especially in the forest is on the whole low, Maleo-eggs laid simply in the earth should come to due development, had puzzled us here already and led us to suspect a connection between the situation of these diggings and the warm spring". Somewhat further on their journey up to Bone valley (ca. 300 m) "we struck Maleo-diggings again, and just as in the last case we discovered not far from them a warm spring of perhaps 50°C, which formed a little brook. Although, on putting the hand in it a sharp smarting sensation of the skin between the fingers resulted, all the stones of the brook there were padded with a blue-green alga. With regard, then, to the breeding of the Maleo we believe ourselves able to maintain that the bird indeed lays its eggs as a rule in the sand on the hot sea-shore. where the heat of the sun then proves powerful enough to hatch them, but that in the mountains and especially in the shady forest of the interior the warmth of the sun must be substituted by something else, and that for this purpose the Maleo then chooses the water of warm springs, which it searches out, and makes its breeding-pits in the ground warmed by them. Accordingly, where Maleos are encountered in the interior of the country, there warm springs should be not far off. The Maleo thus makes use of two inorganic sources of warmth, by which its eggs are to be hatched, namely, on the one hand the sun, on the other warm springs[1]). Of the latter condition we found still further confirmation, for near another still hotter spring, in which

[1]) Other Megapodes make use of the heat produced by the fermentation of vegetable matter placed on their eggs.

one could not keep the hand and which had formed a considerable pool, Maleo-pits were again found. We had them dug out and procured two eggs for our rapidly diminishing larder. Finally we came across a third [fourth] warm spring, and observed Maleo pits near it also". Later the Sarasins found Moleo-pits also on the Lokon volcano in ground strongly heated by hot steam.

Thus the Drs. P. & F. Sarasin have established a most striking instance of avian wisdom. In the case of the Moleo breeding in the hot volcanic sand of Wallace Bay, it might always be urged that the bird at first laid everywhere indiscriminately, but that young were produced only from the eggs which chanced to have been deposited in the black sand, but it is going too far to apply this suggestion to the case of the hot springs of the interior; moreover, it brings no explanation why the young hatched in the black sand returned to the same spot to breed. Birds in their philoprogenitive carefulness have learnt that their eggs must be kept warm, or they will perish, and the Moleo has discovered the best means in its power for procuring the welfare of the young, which, perhaps for the following reasons, it is unable to look after in the usual manner of birds.

Mr. Wallace believes that a period of 10—12 days elapses between the laying of the successive eggs of the Moleo (the natives asserted 13) and that the bird lays about eight eggs in a season, "so that an interval of three months elapses between the laying of the first and last egg". The breeding season was indicated by Mr. Wallace as the months of August and September, but Dr. Guillemard notes that, according to the natives, the period was much more extended. When Meyer visited Wallace Bay in May, 1871, no eggs indeed were found, but the birds were there in troops. Rosenberg says the bird breeds in the Bone valley from March to July; in the higher parts of this valley the Sarasins obtained the eggs in January. Very probably the breeding period varies with the season, whether rainy or dry, and this often differs on opposite coasts, and in the mountains and on the lowlands (see Introduction). The great number of days which is supposed to elapse between the laying of one egg and the next is believed to be necessary for the development of the unusually big egg, which, as Dr. Guillemard says, weighs 8½ to 9½ ozs. (about ¼ ko), and which in females killed by Mr. Wallace before they had laid, completely filled up the lower cavity of the body, the remaining eight or ten eggs in the ovary being about the size of small peas. Mr. Wallace shows that the nesting habits of the Moleo may be accounted for by the peculiarity in its organization, which causes it to lay great eggs with considerable intervals between them: owing to the long time which must pass before the whole batch is laid, the bird cannot hatch them in the ordinary way, for its peculiar food (consisting of fallen fruits[1]) would become exhausted and the bird would starve. In consequence therefore of this slowness in laying "they must quit their eggs to obtain their own subsistence — they must bury them to preserve them from wild animals".

[1]) Rosenberg found in the stomach remains of snails, insects, and the fruit of *Pangium edule* (a high tree, belonging to the *Bixineae*, cultivated nearly everywhere in the East Indian Archipelago).

Dr. Guillemard takes a different view of the matter: the bird buries its eggs in the sand, often to a depth of three feet or more, in order that they may be safe from the attacks of depredators, and no chick of ordinary size could work its way to the surface; hence he concludes that "the strength and enormous size of the egg are adapted to the peculiar nesting habits of the species, rather than that the unusual nidification is due to an aberrant reproductive organisation".

But it is not merely with extra size and strength in the chick that the unusually large egg of the Megapodes is associated; the great length of the egg, as compared with its width, is certainly necessary to the development of the flight-feathers of the chick, which, in the case of some Megapodes, is able to fly the very day it is hatched. This is the case in the Moleo, as Mr. Wallace was assured by Mr. Duivenbode of Ternate. The latter "had taken some eggs on board his schooner, which hatched during the night, and in the morning the little birds flew readily across the cabin".

The following explanation of the origin of the breeding economy of the Moleo is almost the same as that of Dr. Guillemard. "Once upon a time" the Megapodes laid ordinary-sized eggs and hatched them like other *Gallinaceae*. Like many other birds, they covered them up to conceal them from foes when obliged to go away to feed. Those birds — they had not then the characters of Megapodes — which nested on the sunny sea-strand always found their eggs hot on their return; they ventured to take longer and longer absences in search of food, and, at last, like the male Ostrich, they returned to them only during the cool night, while some which had covered up their eggs more deeply, finding they kept their heat, gradually abandoned this nightly visitation also. Moreover, brooding on the eggs was discouraged by frequent scares from prowling mammals and reptiles, which, frightening the parent-bird away, devoured the exposed contents of the nest; often, too, the sitting bird was pounced upon, and the habit of sitting was gradually abandoned as a failure. Meanwhile, the eggs, buried deeply enough to keep warm, produced chickens, some of which, unable to work their way to the surface, found their cradle and grave in one; many others, emerging on to the strand without a mother near to protect and teach them, were easily caught and destroyed by innumerable foes; only such as were stronger, shyer, more active, and more fortunate escaped. The process of natural selection increased in severity as time went on, for the enemies of the Megapode, outwitted at first, learnt more of its novel breeding habits; the eggs, therefore, required more careful burying, and the young needed to be more active and quick-witted to escape; with the result that in the typical Megapodes the eggs are at this day buried in huge artificial heaps of rubbish collected by the parents and often covered over very deeply and — for a searcher — awkwardly (we read of 6 feet, 5 feet, 6 feet — found "after several hours' hard digging" — in Gould, and it would be easy to multiply instances), while the Moleo

of Celebes sometimes plants them in upwards of three feet of sand, and its chick, like some others, is able to fly the day that it is hatched. For the production of a young one so advanced in development a large and long egg was necessary.

Primarily, in short, the Megapode buried its eggs in order to hide them from egg-eaters; then it discovered inorganic means for preserving heat, without which its eggs would perish; it then abandoned the habit of brooding, as dangerous to its progeny and itself; then, owing to all sorts of natural dangers and difficulties encountered by the chicks, those of its eggs which produced the strongest and most developed ones proved to be useful variations and survived, and these were naturally the biggest[1]). Mr. Wallace takes the big egg as the primary condition, which gave rise to the others, but we think Dr. Guillemard's view the more reasonable; it assumes no condition unknown to naturalists, whereas Mr. Wallace gives no reason to account for the supposed originally aberrant ovulation.

It is hard to conceive what more could be done for the protection of the Moleo and its progeny, yet it is probable that its eggs still suffer considerably, being dug out by men, who, according to Mr. Wallace, come from more than fifty (!) miles round to search for them, and, as Meyer found, they are also dug for by crocodiles. They are said to be of excellent flavour. Nevertheless, even here it is possible that a protective step is in process: "Do you know", writes Dr. Riedel (in lit. to Meyer), "that the eggs of the Maleo are uneatable once a year, namely, when it has eaten the fruit of a certain tree? If then eaten, a flushed face and a feverish feeling for several days is the consequence".

ORDER TURNICES.

The Bustard-quails fall into two genera only — *Turnix* of Africa, S. Europe, and S. Asia, to Australia, and *Pedionomus* of which a single species is known in Australia. *Turnix* is held by Dr. Gadow to have its nearest relations of a higher order with the *Galli*; *Pedionomus* is a lower form which affords a transition from *Turnix* to the *Ralli*, and Gadow regards the two genera of the order as forming 2 families, *Turnicidae* and *Pedionomidae*. *Turnix* has three toes only, the hallux being absent; *Pedionomus* has a small hallux, a different number of pectoral ribs, being the same as in the *Ralli*, it is aquintocubital, has both carotids (*Turnix* only the left one), etc. (see Gadow, in Bronn's Kl. & Ord. VI, pt. 4, 1893 II, 170).

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[1]) It seems wrong to argue that strong and advanced chicks would be equally likely to proceed from the little eggs; as a rule, we believe, the smaller members of a brood of birds, or of a litter of mammals, are the more feeble, and the larger are the stronger and swifter.

Turnix can always be distinguished from the Quails and other Gallinaceous birds and from the Rails by the absence of the hind toe. From the three-toed *Limicolae* it differs by its general Quail-like appearance, Gallinaceous bill, and short blunt wing.

FAMILY TURNICIDAE.

The *Turnicidae* differ from *Pedionomus* by the characters mentioned above.

GENUS TURNIX Bonnat.

Plumage variegated; tail short, once to twice the length of the tarsus; tarsus scutellated in front and behind; hallux absent; wing rounded, first quill reaching to the tip, inner secondaries almost equally long. Sexes dissimilar, the female handsomer and pugnacious, the male weaker and plainer, brooding on the eggs.

* 292. TURNIX RUFILATUS Wall.

Celebes Bustard-quail.

a. **Turnix fasciatus** *(1)* Gld. (nec Temm.), B. Asia VII, pl. 11 (1861).
Turnix rufilatus *(1)* Wallace, P. Z. S. 1865, 480; *(2)* Walden, Tr. Z. S. 1872, VIII, 87; *(3)* Platen, Gefied. Welt 1887, 206, 230; *(4)* Grant, Ibis 1889, 447, 460; *(5)* id., Cat. B. XXII, 1893, 536; *(6)* Büttik., Weber's Reise in Ost-Ind. 1893, III, 281; *(7)* Hart., Nov. Zool. 1896, 164, 576; *(8)* id., ib. 1897, 166.
b. **Turnix rufilata** *(1)* Gray, HL. II, 1870, 270, Nr. 9737.
c. **Turnix rufilateralis** *(1)* Rosenb., Malay. Archip. 1878, 276.
Figure and descriptions. Gould *a I*; Wallace *1*; Grant *5*.
Adult female. "General tone above warm brown, greyish on the mantle, and inclining to rufous on the rump, each feather vermiculated with black, and some in the middle of the back and scapulars with a subterminal black blotch. Feathers of the top of the head black, margined with rusty brown; lores black; superciliary stripe and sides of the head white and black. Chin, throat, chest, and breast white barred with black; middle of belly whitish buff, sides of belly, flanks, and under tail-coverts rusty buff. Wings and wing-coverts as in *T. taigoor* [blackish brown — the wing-coverts rufous or brown on the inner web and buff on the outer, and barred with black], but the outer primary only is edged with whitish buff: — bill and feet pale greenish yellow; [claws pale, Wallace *1*]. — Wing 91 mm; tail 33; tarsus 28" (Grant *5*).
"Iris whitish; feet ochreous, joints greenish; bill ochreous" — Doherty *8*.
Male. „The males are decidedly smaller than the females, the black borders to the throat-feathers are very narrow, the chin almost pure white, the wing-coverts have more white, the scapulars rather less, not more rust-colour" (Hartert *8*).
Distribution. Celebes: — Near Macassar (Wallace *1*, *5*, Weber *6*, Everett *7*); Indrulaman near Bonthain (Ev. *7*); Minahassa (Platen *3*); West Celebes — Tawaya (Doherty *8*).

In North Celebes this Hemipode has been recorded only by Dr. Platen; in the South of the Island Macassar and Indrulaman are the only localities yet

known for the species, but Doherty got it in West Celebes with the next species. Its nearest affinities are with *T. powelli* Guillem. of Gunong Api (Fire Island) off Sumbawa, described as wanting the rufous on the abdomen and thighs, with other differences (Guillemard P. Z. S. 1885, 511, Hartert 7).

The genus *Turnix* illustrates a curious reversal of certain peculiarities which commonly appear to pertain to the different sexes in birds. The female of *Turnix* is larger than the male, has a more highly developed plumage, is very pugnacious during the breeding-season, fighting with other females, and does not attend to its eggs and young; the male is smaller and generally resembles the young female, is quieter in disposition, and hatches the eggs and takes care of the young. A full investigation of this subject would no doubt produce matter of great interest. It has been suggested that the female is polyandrous Krohn, "Gefiederte Welt" 1894, 190). Systematically, the genus has been well handled by Mr. Ogilvie-Grant in the Ibis 1890, 446—475, when 23 species are admitted, and in the Catalogue of Birds 1893, XXII, in which the number is reduced to 21 species. Some observations on the birds in captivity are recorded in "Gefiederte Welt" 1892, 63 et seq. and 1894, 49 et seq.

293. TURNIX MACULOSA (Temm.).

Black-backed Bustard-quail.

a. **Hemipodius maculosus** *(1)* Temm., Pig. & Gall. III, 1815, 631, 757.

b. **Turnix maculatus** *(I)* Vieill., Gall. Ois. II, 51, pl. 217 (1825).

c. **Hemipodius melanotus** *(I)* Gld., B. Austr. 1848, V, pl. 84.

d. **Turnix melanotus** *(1)* Gld., HB. B. Austr. 1865, II, 182; *(2)* Ramsay, Tab. List 1888, 18.

e. **Turnix beccarii** *(1)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 675; *(2)* W. Blas., J. f. O. 1883, 119; *(3)* Salvad., Ibis 1890, 130; *(4)* Grant, t. c. 344.

f. **Turnix melanonota** *(1)* Salvad., Orn. Pap. III, 1882, 258, pt.; *(2)* id., Agg. 1891, 195.

Turnix maculosa *(1)* Grant, Ibis 1889, 451, 465, 467, 468; *(2)* id., Cat. B. XXII, 1893, 546; *(3)* Hart., Nov. Zool. 1897, 166.

For further synonymy cf. Salvadori *f 1*, Grant *2*.

Figures and descriptions. Vieillot *b I*; Gould *c I*; Salvadori *e 1*, *f 1*; Grant *2*.

Description. Above varied with grey, black, rufous-chestnut and pale fulvous; abdomen and throat whitish fulvous; upper breast fulvo-rufous.

Head above black, feather-edges and mesial streak on head pale fulvous; lores, superciliary stripe and sides of head pale fulvous; cheeks and auricular region spotted with black; hind neck, back, uropygium and upper tail-coverts dusky grey, varied with spots and bandlets of black and rufous chestnut, the feathers broadly edged externally with pale fulvons, with a submargin of black; abdomen fulvous whitish, the upper breast and sides fulvo-rufous; the feathers of the sides with lunulate marks of black in the middle; wings pale fulvous, the upper coverts lunulately marked with black, the under ones unspotted; remiges fulvous grey, margined with pale fulvous; tail like the back; upper mandible dusky, the lower and feet yellowish. Wing 64, 70 mm; bill 10; tarsus 17, 19 (Salvadori *e 1*).

Distribution. N. & E. Australia and the Interior; also S. coast of New Guinea; S. E. Celebes (Beccari *2*); W. Celebes (Hartert *3*).

Two examples of this species were obtained by Beccari near Kandari in the S. E. Peninsula in June, 1874, and were named after their discoverer by Count Salvadori. Mr. Ogilvie-Grant, who examined them, pronounces that they are "exactly identical in plumage with specimens of the Australian *T. maculosa* of a similar age, and differ only from them in being a smaller insular race": wing 5.0 to 7.6 mm shorter. A pair of examples were obtained by Mr. Doherty at Tawaya in West Celebes, and the female was also found by Mr. Hartert to be smaller than four Australian females, the male paler than an Australian male. Mr. Grant also believes that *T. rufescens* Wall. of Semao will prove to be identical, in which case the distribution of the bird will bear some similarity to that of *Circus assimilis*.

T. rufilatus is easily to be distinguished from this bird by its having the throat and breast barred with black and white, by its larger size, etc.

ORDER RALLI.

Systematists are far from being agreed as to the limits of this order. The *Rallidae*, or Rails proper, have relationships with the *Parridae*, *Heliornithidae*, *Eurypyga*, *Rhinochetus*, *Gruidae*, *Psophiidae*, *Aramidae*, *Otidae*. The *Parridae* seem to connect the Rails with the *Charadrii*. A large number of *Rallidae* occur in Celebes, but none of the other related families, except the *Parridae*, which may be placed in the order *Limicolae*.

FAMILY RALLIDAE.

The Rails and Water-hens. Generally species of concealed habits, not taking readily to flight; running, or, as the case may be, swimming well; inhabiting long grass, reed-growths, swamps, etc.; feeding chiefly upon vegetable matters, also on worms and insects; in most cases more often heard than seen.

The wing is often of moderately large size, but the birds are of weak flight, rising slowly and heavily; in a few genera peculiar to small islands the wing is so reduced as to be unavailable for flight. The tail is short and often soft, consisting of 10 to 14 rectrices. The tarsus is entirely naked, tranversely scutellated in front; a hallux, smaller than the other toes, and slightly raised above them, is present. The bill is very variable in form — long, slender, and decurved in *Rallus*, or Parrot-like in its stoutness in *Porphyrio*.

The Rails are without a crop, have a U-shaped furcula, one notch on each

side in the posterior margin of the sternum, two carotid arteries, a schizognathous palate, with a long, slender vomer pointed in front. They are of cosmopolitan distribution.

GENUS GYMNOCREX Salvad.

Distinguishable from all the other Rails occurring in Celebes by its having the middle toe and claw much shorter than the tarsus, and by the large space of bare skin behind the eye. Bill shorter than tarsus, high at the base, attenuated at the tip. Wing large, 4th and 5th primaries longest. Tail about as long as the tarsus.

The genus was described from Celebes. An aberrant species is known also from the Halmahera group and the Papuan Islands.

* 294. GYMNOCREX ROSENBERGI (Schl.).

Bald-faced Rail.

Plate XLII.

a. **Rallina rosenbergii** *(1)* Schl., Mus. P.-B., Ralli, 1865, 78, in Index; *(2)* id., Ned. Tdschr. Dierk. 1866, III, 212; *(3)* Rosenb., Malay. Archip. 1878, 278, 596.

b. **Eulabeornis rosenbergii** *(1)* Gray, HL. 1871, III, 57, Nr. 10382.

c. **Rallina (?) rosenbergii** *(1)* Wald., Tr. Z. S. 1872, VIII, 96.

Gymnocrex rosenbergi *(1)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 678; *(2)* id., Orn. Pap. 1882, III, 269; *(3)* Sharpe, Cat. B. 1894, XXIII, 52, 331; *(4)* M. & Wg., Abh. Mus. Dresd. 1895 Mai, Nr. 8, p. 18.

d. **Schizoptila rosenbergi** *(1)* Brügg., Abh. Verh. Bremen 1876, V, 94, 101.

e. **Rallus rosenbergi** *(1)* Rosenb., Zool. Garten 1881, 167.

Descriptions. Schlegel *a 2*; Rosenberg *a 3*; Salvadori *1*; Brüggemann *d 1*; Sharpe *3*.

Adult female. Above brownish maroon, brighter and reddish chestnut on the wings, duller and browner on the hind-neck, washed with slate-black on the head; rump blackish; upper tail-coverts and tail black; cheeks, chin, fore-neck and remaining under-parts blackish slate; under wing-coverts shining dusky brown, broadly tipped with impure white; remiges below slightly paler brown; lores scantily covered with blackish hair-feathers; skin around the eyes and on sides of occiput naked, "bluish; iris orange with a red tone; bill above brownish, below greenish; legs slate-grey"; wing 208 mm; tail 78; tarsus 72; middle toe and claw 46; bill from feathers of forehead 39 (♀, from near Tomohon, end of April 94: P. & F. Sarasin).

Immature. Similar to the adult, but the plumage of the rump and breast softer and more fluffy; bill shorter; "iris —? eyelid light red; bare skin violet; bill above blackish, below green-yellow, tip horny; legs green-yellow"; wing 195 mm; tarsus 72; bill 37 (sex? Rurukan, 27. Apr. 94: P.& F. Sarasin).

Rosenberg indicated the skin of the face to be pale yellowish green; probably the colour was not observed when in a fresh state.

Distribution. North Celebes: — Kema (v. Rosenberg *a 1*), near Tomohon and Rurukan (P. & F. Sarasin), Manado (Bruijn *1*), the Minahassa (Fischer *d 1*); Limbotto (v. Rosenberg *e 1*).

The Bald-faced Rail is one of the peculiar types of Celebes. Its nearest known affinities are with *G. plumbeiventris* Gray of the Papuan Islands and Halmahera group, a species which is included in the same genus *Gymnocrex* by Count Salvadori and others. The two birds differ widely, however; *G. rosenbergi* has a longer tarsus and shorter toes, the middle toe and claw being less than $^2/_3$ of the length of the tarsus, as against $^4/_5$ in the other form; the bill of *G. rosenbergi* is but little more than half the length of the tarsus und presents a curiously dwarfed, wasted appearance towards the end, while the bill of *plumbeiventris* is over $^5/_6$ of the length of the tarsus; the latter species has also a comparatively small extent of bare skin on the face, chiefly behind the eye. In plumage the chestnut head, breast and mantle, the greenish olive back, and the black rump and tail of *G. plumbeiventris* give it a very different appearance from *G. rosenbergi*.

The habits of *G. rosenbergi* may be expected to afford many interesting peculiarities; unfortunately nothing is known about them at present. The long tarsus and short toes call to mind certain plovers and herons; the thin, worn-down end of the bill with the cutting edges rolled inwards suggests that the bird pecks about for its food to a depth of half an inch or more in sand or gravel or such like; its long wings show it to have good powers of raising itself in the air, though their rounded and somewhat hollow shape below seems to betoken short flights. It is a rare bird in North Celebes — or, at least, is hard to obtain; some half dozen specimens only have been recorded in European collections.

GENUS ARAMIDOPSIS Sharpe.

As is pointed out below this peculiar Celebesian Rail is allied to *Aramides* of South America, but differs by having the rectrices no longer than the overlying feathers of the rump and flanks, the primaries hardly longer than the secondaries, forming a short, square wing, and the bill less stout at the base. Its differences from *Rallus* are shown in the text. From the other Rails occurring in Celebes it may be distinguished by its long straight bill, which, measured from the nasofrontal suture, is about as long as the tarsus: the middle toe is slightly shorter than the tarsus.

* 295. ARAMIDOPSIS PLATENI (W. Blas.).

Long-billed Rail.

Plate XLII.

a. **Rallus plateni** *(1)* W. Blas. in Russ' Isis 1886, 103; *(2)* id., "Braunschw. Anzeigen" 3. März, 1886; *(3)* Schalow, J. f. O. 1886, 399; *(4)* Heine & Rchw., Nomencl. Mus. Hein. 1890, 321.

Aramidopsis plateni *(1)* Sharpe, Bull. B. O. C. 1893, Nr. X, p. LIV; *(2)* id., Ibis 1893, 568; *(3)* id., Cat. B. XXIII, 1894, 331; *(4)* M. & Wg., Abh. Mus. Dresd. 1895 Mai, Nr. 8, p. 18.

Descriptions. W. Blasius *a 1*, *a 2*; Sharpe *3*.

Male scarcely adult. Above olivaceous, with slaty on the mantle and shoulders, with chestnut on inner remiges and rump; hind neck chestnut-rufous; head mouse-grey, dark brown on middle of crown and on nape, passing into the rufous of the neck; chin and upper throat white; fore-neck and breast slaty mouse-grey; sides of body and abdomen dusky, barred with white, the bars on the abdomen buffy and ill-defined; thighs brownish dusky; under wing-coverts dusky black, barred with white; remiges below shining brownish dusky: wing 160 mm; tail 33; tarsus 62; middle toe with claw 56; bill from feathers of lores 52 (♂, Tomohon, 3. V. 94: P. & F. Sarasin — C 13895).

Adult female. Similar to the male, but the hind neck brighter chestnut-rufous, the white on chin less extended: "iris orange; bill above and at the tip horn-colour, elsewhere red; feet slate-blue-grey"; wing 157 mm; tarsus 60; bill from lores 52 (♀, Tomohon, April, 1894: Sarasin Coll.).

Dr. Platen indicates the soft parts in the type as: "bill brownish, base of the mandible yellowish green; feet black; iris brown" *(3)*.

Distribution. N. Celebes — Minahassa: Rurukan (Platen *a 1*, *a 2*), Tomohon (P. & F. Sarasin).

The Celebesian Long-billed Rail was the most remarkable of Dr. Platen's discoveries made during his stay at the mountain village of Rurukan in the Minahassa in 1884—85. The two specimens described above were obtained by Drs. P. & F. Sarasin two or three miles away at Tomohon (c. 2500 ft.), so that at present the bird is known only as a mountain species, where it is probably an inhabitant of the forests. Prof. W. Blasius at first placed it in the genus *Rallus*, but the bill is relatively much stouter, straighter and more even throughout its length — not slightly decurved and thinner towards the end; the primary formula is different, the 5th and following (not the 2nd and 3rd) being the longest, and the secondaries are not appreciably shorter than the longest primaries, but all the remiges are fairly equal, forming a curious square wing. The wing is moreover much hollowed out and rather small, and the tips of the quills are soft; evidently the bird is a bad flyer. The middle toe with claw is shorter than the tarsus, but in *Rallus* it is much larger, and the outer toes in the Celebes form are relatively smaller, being about $^{8}/_{10}$ of the middle one, as against $^{9}/_{10}$ in *Rallus*. Dr. Sharpe, in making the genus *Aramidopsis* for it, speaks of it as having its nearest affinities with the S. American *Aramides*, only pointing out that the bill of the latter is thicker at the base; but other differences exist.

Aramidopsis is practically tailless, the diminutive rectrices of 33 mm being buried amongst the equally long rump-feathers and under tail-coverts; *Aramides* has an appreciable tail of about 65 mm; the wing of *Aramidopsis* is almost square, the longest primaries being only about 7 mm longer than the secondaries; in *Aramides* the primaries overreach the secondaries by about 20 mm. Nevertheless, the near affinities of the two forms are obvious, and are the more

remarkable when the geographical remoteness of the two forms from one another is considered.

Nothing is known of the habits of *Aramidopsis*. *Aramides* is said to frequent "the thickest parts of the woods and perch during the night, and sometimes even in the day-time, on the low trees or tufted bushes. The note of one of the species is so loud and clear as to be heard at the distance of a mile, and it is sometimes interrupted by sonorous whistling" (Gray, Gen. B. 1849, III, 594).

GENUS HYPOTAENIDIA Rchb.

Culmen longer than the cranium, but shorter than the tarsus, fairly straight, slightly thicker at the base, nasal groove about $^2/_3$ its length; tarsus shorter than middle toe and claw; tail a little longer than the tarsus; wing small, 2nd or 3rd primary the longest. The sides and flanks — sometimes the entire under surface — are barred with black and white. The genus is found from India and South China to Australia and New Zealand; it has occurred in Mauritius.

296. HYPOTAENIDIA STRIATA (L.).

Plumbeous-breasted Rail.

a. **Rallus striatus** *(1)* Linn., S. N. 1766, I, 262 (ex Brisson); *(2)* Swinh., P. Z. S. 1863, 321; *(3)* id., Ibis 1863, 427; *(4)* Jerdon, B. Ind. 1864, III, 726; *(5)* Finsch & Conrad, Verh. z.-b. Ges. Wien 1873, 18 (sep. copy); *(6)* Joest, Holontalo 1883, 105; *(7)* Stejn., Pr. U. S. Nat. Mus. 1886, 362.

b. **Rallus gularis** *(1)* Horsf., Tr. L. S. 1821, XIII, 196; *(2)* Bernst., J. f. O. 1861, 190.

Hypotaenidia striata *(1)* Bp., Compt. Rend. 1856, XLIII, 599, Nr. 334; *(2)* Schl., Mus. P.-B., Ralli, 1865, 24; *(3)* Wald., Tr. Z. S. 1872, VIII, 95; *(4)* ? Pelz., Ibis 1873, 40; *(5)* Salvad., Cat. Ucc. Borneo 1874, 336; *(6)* Hume, Str. F. 1876, IV, 294; *(7)* David & Oust., Ois. Chine 1877, 488; *(8)* Hume & Davis., Str. F. 1878, VI, 468; *(9)* Legge, B. Ceylon 1880, 775; *(10)* Sclat., Ibis 1880, 312; *(11)* Bingh., Str. F. 1880, IX, 197; *(12)* Butler, t. c. 432; *(13)* Wardl. Rams., Tweedd. Orn. Works 1881, 660; *(14)* Blas. & Nehrk., Jb. Ver. Naturw. Braunschw. 1881, 60; *(15)* A. Müll., J. f. O. 1882, 437, 441; *(17)* Kelham, Ibis 1882, 189; *(18)* Oates, Str. F. 1882, X, 242; *(19)* Nichols., Ibis 1883, 257; *(20)* Oates, B. Brit. Burmah 1883, II, 339; *(21)* Vorderman, N. T. Ned. Ind. 1883, XLII, 109; *(22)* Guillem., P. Z. S. 1885, 273; *(23)* Hume, Str. F. 1888, XI, 329; *(24)* Everett, J. Str. Br. R. A. S. 1889, 201; *(25)* Steere, List B. & M. Philipp. 1890, 26; *(26)* Oates ed. Hume's Nests & Eggs 1890, III, 399; *(27)* Vorderm., N. T. Ned. Ind. 1890, XLIX, 416; *(28)* Hagen, T. Ned. Aard. Genoots. 1890, (2) VII, 165; *(29)* Salvad., Ann. Mus. Civ. Gen. 1891, (2) XII, 76; *(30)* De La Touche, Ibis 1892, 411; *(31)* Sharpe, Notes Leyd. Mus. 1893, 267; *(32)* id., Cat. B. 1894, XXIII, 33, 329; *(33)* Munn, Ibis 1894, 77; *(34)* Rick., t. c. 225; *(35)* Sharpe, t. c. 257; *(36)* Bourns & Worces., Birds Menage Philipp. Exped. 1894, 30; *(37)* M. & Wg., Abh. Mus. Dresd. 1895, Mai, Nr. 8, p. 18.

c. **Rallus indicus** *(I)* Rchb., Fulicariae, Novit. figs. 2575—76 (1851).

d. **Hypotaenidia gularis** *(1)* Stejn., Pr. U. S. Nat. Mus. 1886, 362.

e. **Hypotaenidia jouyi** *(1)* Stejn., ib. 363; *(2)* Styan, Ibis 1891, 329, 500.

Figure and descriptions. Reichenbach *c I*; Jerdon *a 4*; Schlegel *2*; David & Oust. *7*; Legge *9*; Oates *20*; Vorderman *21*; Sharpe *32*; Stejneger *a 7*, *d 1*, *e 1*.

Adult male. Above black, the feathers fringed with raw umber, the cervix and mantle with white lateral spots, which extend into irregular white bars on the back and wings; wings generally browner than the back; head above brown with black centres, passing into dull chestnut on supraloral region, sides of occiput, nape and neck; lores, cheeks, jugulum, and breast slate-grey; chin and upper throat white; abdomen, sides, under wing-coverts and thighs dusky, barred with white; quills below dusky brown, barred with white not quite across; "iris red; bill-culmen dark brown, paling to slate at the tips, the sides of both mandibles red; legs and feet olivaceous or livid brown, with the joints darker; claws pale brown" — Legge *9* (♂, S. Leyte: Everett — C 4502).

Immature. Like the adult, but more uniform above, marked only with spots or short cross-streaks of white, none on the primary coverts; hardly any chestnut on sides of head and neck; the slate-grey of the jugulum and breast varied with fawn-colour; middle of abdomen whitish; "bill reddish grey; iris sepia; feet grey" (♂, Kema, N. Celebes, 26. Aug. 93: P. & F. Sarasin).

Young. "Differs from the adult in having the bill black, and the upper surface much darker and without any white spots and bars on the back; the head blackish, and the back darker olive-brown, with broad black centres to the feathers; no rufous on the sides of head or sides of crown and sides of neck" (Sharpe *32*).

Winter dress. "Plumage entirely overshaded with olive-brown, and there is a distinct fulvescent tinge on the abdomen and under tail-coverts, almost hiding the black bars on the latter" (Sharpe *32*).

Measurements. Wing 115—120 mm; tail 40; tarsus 35, 36; mid. toe with claw 41; culmen fr. nasofrontal sut. 35—38 (2 examples).

Eggs. "The eggs in my collection, some from Formosa, the others from Pegu (the latter obtained by Oates 10. Sept. 1880 and 11. Oct. 1876), resemble those of our *Rallus aquaticus*. The maculation is, however, a different one, much more copious and intense, so that they can be readily distinguished. The measurements are: 33.5 × 26 mm" (Nehrkorn MS.). 6 or 7 in number; oval, occasionally almost pyriform; pure white to rich salmon-pink, blotched, spotted and specked with burnt Sienna-red to dull reddish purple, with subjacent markings of greyish lilac (ex Hume *26*).

Nest. A pad or heap of grass, 1 to 12 inches thick, 6 to 10 in. diam. at top, placed in grass, rushes, or standing rice close by water (Hume *26*).

Breeding time. "From May to October according to locality" (Hume *26*).

Distribution. Bengal and Southern India (Hume *26*, etc. *32*); Ceylon (Legge *9*); Pegu (Oates *18*, *20*, etc.); Tenasserim (Davison *8*, *32*, Bingham *11*); China — Lower Yangtse (Styan *e 2*); S. China (David *7*, Rickett *34*); Formosa (Swinhoe *a 2*, *a 3*); Cochin China (Diard *2*, Conrad *a 5*); Siam (Swinhoe *a 3*); Malay Peninsula (Cantor, Maingay, etc. *32*); Sumatra (Raffles *5*, H. O. Forbes *19*, etc.); Java (Horsfield *b 1*, Bernstein *b 2*, etc.); Borneo (Doria & Beccari *5*, Low, Mottley *24*); Philippines — Luzon, Cebu, Leyte, Guimaras, Panay, Negros, Samar, Siquijor, Calamianes, Mindanao, Sooloo (Everett *13*, Steere *25*, Bourns & Worces. *36*, Guillemard *22*, *35*); Celebes — Minahassa (Wallace *3*, P. & F. Sarasin *37*).

The Plumbeous-breasted Rail was originally described by Brisson from the Philippine Islands, throughout which it seems to occur. As to Celebes, it has

been recorded, so far as we know, only from the Minahassa, and in three specimens, two adults in the British Museum and one scarcely adult bird in the Sarasin Collection. Whether these specimens were on migration or not is doubtful. The bird breeds in abundance in Pegu, as Oates has shown, and Swinhoe *(a 3)* obtained the eggs in Formosa. Styan marks it as a summer visitant to the Lower Yangtse, and Capt. Butler *(12)* as such in Belgaum, Bombay Presidency, where it breeds in August and September. In Ceylon Col. Legge is inclined to think it a winter visitant.

In a careful article *(a 7)* Dr. Stejneger has attempted to show that three forms of this Rail exist, a large race with white-spotted primary-coverts from South China, a small race from Malacca — Java, and a small race with unspotted primary-coverts from the Philippines, but these results are disproven with the material in the British Museum by Dr. Sharpe, who considers that the differences in plumage can be accounted for on the score of age alone. The Andaman Islands, however, are known to be inhabited by a dark race, *H. obscurior* Hume.

Rather nearly allied to *H. striata* is *H. philippensis* (L.), which also is found in Celebes. The latter is much larger (wing 145 mm as against 120), has a long, broad superciliary stripe of grey, the remiges banded with rufous, not with white (except the two outermost), the upper-parts much more rufous and paler, the throat and jugulum only (not breast) grey, the breast banded like the other under-parts.

H. celebensis is easily recognised by its uniform olivaceous upper surface, and by its having all the under-parts black, barred with white.

The habits of *H. striata* are well described by Bernstein *(b 2)*, Oates and Legge. In Java the former describes it as plentiful in damp, marshy pastures, low wastes of Alang-alang and Glagah, ditches between fields, etc.; a shy bird, usually overlooked owing to its habits of concealment, often caught during the rice and grass harvests owing to its running and hiding under the heaps of straw or hay. It feeds on insects, worms, small snails, and such like. In anxiety it utters a sharp, shrill cry, also making a noise at times like "hup, hup, hup" by forcibly ejaculating the air from its air-sacks.

297. HYPOTAENIDIA PHILIPPENSIS (L.).

Banded Rail.

a. **Rallus philippensis** *(I)* Linn., S. N. 1766, I, 263 (ex Brisson); *(II)* Buller, B. N. Zeal. 1873, 176, pl. 20, fig. 2; *(3)* Hutton, Ibis 1873, 350; *(4)* Brügg., Abh. Ver. Brem. 1876, V, 92; *(5)* Nicholson, Ibis 1881, 156; *(6)* id., ib. 1882, 69; *(VII)* Buller, B. N. Zeal. 2nd ed. 1888, II, 95, pl. 33; *(8)* Wiglesw., Av. Polyn. 1892, 59.

b. **Rallus pectoralis** *(I)* Gld., B. Austr. VI, pl. 76 (1848); *(II)* Finsch & Hartl., Orn. Centralpol. 1867, 157, t. III, f. 3 (egg); *(3)* Gräffe, J. f. O. 1870, 414; *(4)* Potts, Ibis 1872, 37; *(V)* id., Tr. & Pr., N. Z. Inst. 1873, V, pl. XVIII (head); *(6)* Hartl., Vög. Madag. 1877, 339; *(7)* E. L. & L. C. Layard, Ibis 1882, 536, 544.

Hypotaenidia philippensis *(1)* Bp., C. R. 1856, XLIII, 599, Nr. 333; *(2)* Schl., Mus. P.-B., Ralli, 1865, 23; *(3)* Gld., HB. B. Austr. 1865, II, 334; *(4)* Wald., Tr. Z. S. 1872, VIII, 95; *(5)* Pelz., Ibis 1873, 41; *(6)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 677; *(7)* Tweedd., P. Z. S. 1877, 688, 702; *(8)* Rosenb., Malay. Archip. 1878, 278; *(9)* Meyer, Ibis 1879, 142; *(10)* Sclat., Ibis 1880, 312; *(11)* Salvad., Orn. Pap. 1882, III, 261; *(12)* W. Blas., J. f. O. 1883, 139; *(13)* Guillem., P. Z. S. 1885, 560; *(14)* W. Blas., Zt. ges. Orn. 1886, 162; *(15)* Ramsay, Tab. List 1888, 21; *(16)* North, Nests & Eggs Austr. B. 1889, 328; *(17)* Tristr., Cat. Coll. B. 1889, 28; *(18)* Salvad., Agg. Orn. Pap. 1891, 196; *(19)* M. & Wg., Abh. Mus. Dresd. 1895, Mai, Nr. 8, p. 18; *(20)* Grant, Ibis 1895, 471; *(21)* Hart., Nov. Zool. 1896, 164.

c. **Rallus philippinensis** *(1)* Rosenb., Zool. Garten 1881, 167.

d. **Hypotaenidia philippinensis** *(1)* Sharpe, Cat. B. 1894, XXIII, 39.

"Werries imbene" or **"Weris iembene"**, Minahassa, Guillemard *13*, Nat. Coll.

"Bulo-ito", general name for Rails [Gorontalo?], Rosenb. *8*.

For further synonymy and references cf. Salvad. *11*, Sharpe *d 1*.

Figures and descriptions. Gould *b I, 3*; Buller *a II, a VII*; Potts *V*; Brüggemann *a 4*; Finsch & Hartlaub *b 2*; Hartlaub *b 6*; Schlegel *2*; Salvadori *11*; North *16* (egg); Sharpe *d 1*.

Adult. Above tawny-olive, the hind neck, back, scapulars, and upper wing-coverts and tail marked with transverse spots of white, more or less surrounded with black; rump clear of spots; remiges banded with tawny-olive and dusky, the two outermost, like some of the tertiaries, barred with white; feathers of head above dark brown, with tawny olive edgings; a broad facial stripe through lores, orbital and auricular region on to sides of cervix chestnut; above this a stripe of light grey; malar region light grey, becoming more plumbeous on the jugulum, and whitish on chin and upper throat; remaining under-parts, including under wing-coverts, dusky, barred with white, flanks and under tail-coverts with cinnamon-buff, which is almost uniform on crissum, thighs and under tail-coverts; "iris Indian-red; bill warm brown; legs, feet, claws light greyish brown" — Everett 7 (ad. Manado: v. Musschenbroek — C 5261).

Female. Resembles the male. A female in the Sarasin Collection (Tomohon, 9. III. 94) has the mantle and back much blacker than the specimen of unknown sex described.

Immature. Like the adult, the mantle and back but faintly spotted with white, the colour being nearly lost in the tawny-olive borders of the feathers, the spots on the wing-coverts rounder and often tawny; the feathers of throat and jugulum cinnamon-buff with grey bases; the chestnut facial stripe almost absent (♀, Kema, 28. Aug. 1893: P. & F. Sarasin).

Dr. Sharpe rightly remarks that profuse white spotting seems to be a sign of age, especially, we should think, when the spots tend to widen into transverse bars.

Measurements. Wing (8 adults, N. Celebes) 138—147 mm; tail c. 60; tarsus 41—45; culmen from supraloral feathers 24—29.

Chick. "Covered with sooty black down of silky texture, but without any gloss; bill greyish white; legs blackish brown, darker behind" (Buller *a VII*).

Eggs. 4 to 6; creamy-white, blotched and spotted, especially about the larger end, with irregular blood-red markings, a few nearly obsolete subjacent spots of faded lilac: c. 36.7 × 28 mm (North *16* — Australia; see also: Gould *3*, Buller *a VII*, Finsch & Hartl. *b 2*; Nehrkorn, J. f. O. 1879, 408).

Nest. In swampy ground, usually of débris from floods, about 23 cm diam., slightly hollowed (North *16*).

Distribution. Philippines — Luzon (Everett *7*, *d 1*, Whitehead *20*); Celebes — Minahassa (Forsten *2*, Meyer *9*, etc.); Gorontalo Distr. (Ros. *2*, Riedel *14*, etc.); Kandari, S. E. Cel. (Beccari *6*); Macassar (Wallace *d 1*); Bulekomba, S. Cel. (Everett *21*); Direction Id., W. of Borneo (H. O. Forbes *a 5*); Cocos Is. (H. O. Forbes *a 6*); Timor (Wallace *11*, *d 1*); Moluccas — Buru, Goram, Koor (cf. Salvadori *11*); Papuasia — New Britain, Duke of York, New Ireland, Solomon Is. (fide Salvad. *11*); Is. of Torres Str. (Macgillivray, etc. *11*, *d 1*); Australia — known almost throughout (Ramsay *15*); New Zealand (Buller *a VII*); W. groups of Polynesia — Marianne and Pelew Is., New Caledonia, Loyalty Is., New Hebrides, Fiji, Samoa, Tonga (fide Wiglesw. *a 8*); Mauritius (A. & E. Newton *b 6*).

In the wide geographical range of this Rail many gaps are seen, the majority of which may well be filled up by collectors in course of time; in the Philippines, for instance, the only definite locality known to Major Wardlaw Ramsay in 1881 was Luzon, where the bird was found by Mr. Everett, and later by Mr. Whitehead and, so far as we know, it has not yet been discovered elsewhere in the group; in the Moluccas Count Salvadori records it from three islands only, and not at all from New Guinea. It occurs in New Zealand, where it seems to be on the increase, and, if the Pacific Rail of Latham is the same, which is doubtful, it was met with in Tahiti by the naturalists accompanying Cook. It has also been encountered far out at sea: on a journey from Sydney to Samoa, many miles east of the Australian coast, one settled on board the ship on which Dr. Gräffe was travelling, so tired that it could be captured by hand. This may be the specimen in the Leyden Museum taken more than 300 miles (100 lieues) from the coast of Australia in the Godeffroy Expeditions. At least one example has reached Mauritius (*b 6*, Dict. of Birds 1894, 764).

Considering that it sometimes makes such great journeys, it is no wonder that ornithologists working with plenty of specimens have found it impossible to establish any constant racial differences. Some amount of local variation undoubtedly exists, however; Dr. Sharpe remarks that "the large majority of Australian birds possess a broad praepectoral band [of cinnamon-buff], and I have never seen a single specimen which had absolutely lost all trace of the orange, as is the case with the majority of the Philippine and Fijian specimens". We take it that the Celebesian, Philippine and Fijian birds are somewhat more advanced in development than the Australian and New Zealand ones, since the pectoral band is better developed in young than in adult examples of the first-named — a reason why Australia should be the original home of the species, for emigrants are likely to become most changed.

A race of this Rail, *H. macquariensis* Hutton, with the back almost unspotted, occurs on Macquarie Island. *H. striata* is easily distinguishable by its wanting the long pale grey stripe over the eyes and ear-coverts, by its plumbeous face, jugulum and breast, by its dusky remiges narrowly barred or notched

with white, and by its small size. *H. celebensis* is uniform olivaceous above, and entirely barred with black and white below, having a long rictal stripe of white.

H. philippensis is a rather common species in N. Celebes. Its habits are said by Gould and Buller to be very similar to those of the Landrail *(Crex pratensis)* of Europe. It rarely flies, but runs with great activity, keeps itself as much concealed as possible, feeds on grasses, seeds, insects, swallowing sand to aid its digestion. In captivity, Sir W. Buller found it seemed to prefer fresh meat minced to any other diet.

* 298. HYPOTAENIDIA CELEBENSIS (Q. G.).

Celebesian Barred Rail.

a. **Rallus celebensis** *(1)* Quoy & Gaimard, Voy. Astrol. Zool. 1830, I, 250, pl. 24, fig. 2; *(2)* Gray, List Grallae Br. Mus. 1844, 116; *(3)* Wallace, P. Z. S. 1862, 345; *(4)* Brügg., Abh. Ver. Bremen 1876, V, 92; *(5)* Rosenb., Zool. Garten 1881, 167.

b. **Eulabeornis celebensis** *(1)* Gray, Gen. B. III, 595 (1846); *(2)* id., HL. 1871, III, 57, Nr. 10376.

Hypotaenidia celebensis *(1)* Bp., Compt. Rend. 1856, XLIII, 599, Nr. 329; *(2)* Schl., Mus. P.-B., Ralli, 1865, 22 (nec syn.); *(3)* Wald., Tr. Z. S. 1872, VIII, 95; *(4)* Pelz.. Ibis 1873, 41, 43; *(5)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 677, 976; *(6)* Rosenb., Malay. Archip. 1878, 278; *(7)* Sclat., Ibis 1880, 309; *(8)* Salvad., Orn. Pap. 1882, III, 260; *(9)* W. Blas., J. f. O. 1883, 139; *(10)* Guillem., P. Z. S. 1885, 560; *(11)* W. Blas., Z. ges. Orn. 1886, 160; *(12)* Sharpe, Notes Leyd. Mus. 1893, 268; *(13)* id., Cat. B. 1894, XXIII, 45, 230; *(14)* M. & Wg., Abh. Mus. Dresd. 1895, Mai, Nr. 8, p. 17; *(15)* Andrews, Nov. Zool. 1896, 267—271; *(16)* Hart., ib. 1897, 166.

"Weris palingan", Minahassa, Nat. Coll.

Figure and descriptions. Quoy & Gaimard *a I*; W. Blasius *11*; Sharpe *13*.

Adult. Above, burnt umber brown, washed with slate-grey on forehead and crown; a broad stripe from lores to sides of nape black; below this a stripe of white from rictus to sides of neck; malar region black; entire under-parts black, narrowly barred with white, the terminal fringes of the under tail-coverts pale cinnamon; the black and white barring of the sides of the breast continued on to some of the inner lesser and middle upper wing-coverts; remiges below dusky brown, obscurely notched on the inner webs with dull rufous; "iris blood-red, bill black, feet grey-brown" — Platen in Mus. Berlepsch (ad., near Manado, Aug.—Sept. 1892: Nat. Coll. — C 10942).

In three other adult specimens — one a female, mother of the young described below — the throat and cheeks are almost entirely black, the feathers crossed only with narrow white terminal edges.

Young. Above as in the adult; the plumage below softer, dusky, barred with white, more buffy on chest, abdomen and under tail-coverts; throat whitish, mottled, rather than barred, with dusky; inner webs of remiges for the most part rufous, vermiculated with dusky; bill much shorter (juv., near Manado, Aug.—Sept. 1892: Nat. Coll. — C 10943).

A second young one (moulting) has the cheeks and lower throat dusky black; upper surface much darker (juv., near Tondano, Aug.—Sept. 92, Nat. Coll. — C 10956).

Variation. There is considerable individual colour-variation in this species, irrespective of

age and season, and, apparently, also of sex. Some adults have the remiges evenly notched with dull rufous on the inner web, others are here vermiculated with rufous and dusky (the notches being broken up); some are more uniform and brighter umber above, others have the middles of the feathers darker; in some the chin and cheeks are nearly black, in others as much white as black; also the barring of the sides of the breast is carried over on to the upper wing-coverts in varying quantities. Our two young specimens differ from one another even more, and, further, they do not fully bear out the distinctions found by Dr. Sharpe *(12)* in other young specimens in the Leyden Museum.

Chick. Clothed in silky brown-black down; bill blackish, tip of lower mandible pale, shell-chipping point whitish; legs and feet leaden brown; tarsus 18.5; middle toe with claw 20.5 mm (4 young, about a day old, with mother, Kema, 19. Aug. 93: P.& F. Saras.).

Claw. The pollex of the chick is furnished with a small claw. This attains to a larger size in the adult, and might possibly be of use in fighting. We find this claw in a number of Ralline genera before us; it would appear to run through the family.

Selenka says that it is also found in many diurnal Birds-of-prey, *Hirundo*, some Game-birds, as well as in Marsh- and Waterfowl (see, also, Gadow, Dict. B. pt. I, 1893, 89).

Measurements (6 adults, N. Celebes). Wing 139—161 mm; tail ca. 55; tarsus 49—51; middle toe and claw ca. 54; bill from supraloral feathers 31—33: in two young specimens 29.5, 30.

The specimen with the smallest wing, but not bill, is a female, the largest is a male, in the others the sex is not marked. From the considerable difference, it is probable that the sexes differ in size, the male being larger.

Distribution. Celebes: — Minahassa (Quoy & Gaimard *a I*, Forsten *2*, etc.), Gorontalo Distr. (v. Rosenberg *2*, *a 5*, Riedel *11*), Paguatt (Leyden Mus. *12*), Kandari, S. E. Celebes (Beccari *5*), West Celebes — Dongala and Tawaya (Doherty *16*).

This Rail was one of the species obtained when the "Astrolabe" visited Manado in July, 1828. It forms one of a group, consisting of *H. sulcirostris* (Wall.), Sula, *H. saturata* Salvad., Salawatti and New Guinea, *H. insignis* Sclat., New Britain, and *H. torquata* (Linn.) of the Philippines. The last is easily distinguishable from *H. celebensis* by its chestnut praepectoral collar and black throat and cheeks; *H. sulcirostris* and *saturata* are less easily separable, but both have the cheeks and throat jet-black and *H. saturata* is said to have a longer and stouter bill, and its tarsus measures, according to Salvadori, 53—57 mm.

This species seems to be rarer in North Celebes than its ally *Hypotaenidia philippensis*, and, so far as we know, it has not yet been recorded from the Southern Peninsula, though Beccari found it in the South-east, and Doherty in the West.

* 299. HYPOTAENIDIA SULCIROSTRIS (Wall.).

Sulan Barred Rail.

a. **Rallus sulcirostris** *(1)* Wall., P. Z. S. 1862, 345; *(2)* Finsch, Neu Guinea 1865, 180.
b. **Rallus celebensis** *(1)* Schl., Mus. P.-B., Ralli, 1865, 22, pt. (in syn.).
Hypotaenidia sulcirostris *(1)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 677, 976; *(II)* Sclat.,

Ibis 1880, 311, pl. VI; *(3)* Salvad., Orn. Pap. 1882, III, 261; *(4)* W. Blas., Ztschr. ges. Orn. 1886, 160; *(5)* Sharpe, Cat. B. 1894, XXIII, 46.

c. **Hypotaenidia jentinki** *(1)* Sharpe, Notes Leyden Mus. 1893, XV, 268; *(2)* id., Cat. B. 1894, XXIII, 330.

Figure and descriptions. Sclater *II* (fig. inaccurate, fide Sharpe); Wallace *a 1*; Sharpe *5*, *c 1*, *c 2*.

Adult. Similar to *H. celebensis*, but throat and fore-neck uniform black. Wing 145 mm; tail 58; tarsus 51; middle toe with claw 51; culmen 39 (ex Sclater, Sharpe).

Observation. Other differences from *H. celebensis* have been urged, but not on good grounds; Mr. Wallace considered the bill longer, and Dr. Sclater, indeed, recorded it as 2.8 in.(!) from the gape, but 1.8 in. was no doubt intended; Dr. Sclater speaks of the bird as smaller, but the measurements given by himself and Dr. Sharpe do not bear out this statement. The latter says it is more uniform on the upper surface, but *H. celebensis* shows great individual variation, as remarked above, in this respect; *H. jentinki*, however, is said to be rufous brown, instead of olive-brown, on the back and wings.

Distribution. Sula Islands (Allen *a 1*, *5*).

The original examples of this Rail were obtained by Mr. Wallace's assistant, Allen, who visited the islands of Sula Mangoli and Sula Besi; they were described by Mr. Wallace as *R. sulcirostris*. In 1893, Dr. Sharpe, overlooking Mr. Wallace's description, named a bird in the Leyden Museum from Sula Mangoli as *H. jentinki*. We can find no grounds, for supposing that this is different from *R. sulcirostris*, and, therefore, unite them.

The Sulan Rail is very closely allied to the Barred Rail of Celebes, and Prof. W. Blasius questions its distinctness. It has close affinities to the east with *H. saturata* of New Guinea and Salawatti, which is said by Count Salvadori to be a much larger bird, with a longer and stouter bill, and perhaps differently coloured feet.

GENUS RALLINA Rchb.

Bill shorter than the cranium, much shorter than the tarsus, moderately stout, pointed, the nasal groove less than $^2/_3$ its length and ceasing a little in front of the anterior margin of the nostril; wing moderately large, 4th and 5th primaries longest; tarsus barely exceeding the middle toe and claw in length; tail longer than the tarsus.

The short bill, somewhat short toes, and size and shape of wing best serve to distinguish this genus from its allies in Celebes. The genus occurs from India, through the Archipelago, to Australia.

* 300. RALLINA MINAHASSA Wall.

Ferruginous-breasted Rail.

a. **Rallina minahasa** *(1)* Wall., P. Z. S. 1862, 335, 346; *(2)* Schl., Mus. P.-B., Ralli, Index 1865, 78; *(3)* Finsch, Neu Guinea 1865, 181; *(4)* Schl., Ned. Tdschr. Dierk. 1866,

III, 349; *(5)* Gray, HL. 1871, III, 58, Nr. 10401; *(6)* Wald., Tr. Z. S. 1872, VIII, 95; *(VII)* Sharpe, Cat. B. 1894, XXIII, 78, pl. VIII, fig. 2; *(8)* Hart., Nov. Zool. 1897, 165.

b. **Rallina tricolor** pt. *(1)* Schl., Mus. P.-B., Ralli, 1865, 18.

Rallina minahassa *(1)* Lenz, J. f. O. 1877, 380; *(2)* Rosenb., Malay. Archip. 1878, 278; *(3)* W. Blas., J. f. O. 1883, 126, 140; *(4)* M. & Wg., Abh. Mus. Dresd. 1895 Mai, Nr. 8, p. 18.

Figure and descriptions. Sharpe *a VII*; Wallace *a 1* (Meyer has figured the skeleton of the allied *R. tricolor* Gr. in Abb. v. Vogelskel. I, pl. XLII, 1883).

Adult female. Above dark olive-bistre, duller on the rump and tail; remiges blackish; head, neck and upper breast very dark ferruginous, paler on chin and throat; under surface black, crossed with narrow white bars about 10 mm apart; sides of breast brown like the upper surface; under wing-coverts black, spotted with white; remiges below blackish, with about four rows of transverse spots of white on the inner webs: "bill above black, elsewhere green; feet black; iris vermilion" (♀, Tomohon, 10. Oct. 94: Sarasin Coll.).

The specimen described is slightly the darkest in shade of five.

Sexes. Sexual differences of coloration are not known to exist.

Measurements.	Wing	Tail	Tarsus	Middle toe and claw	Bill from lores
a. (Saras. Coll. Nr. 38) ♀ ad., Tomohon, 23. IV. 94	140	65	45	42	20.5
b. (Sar. Coll. Nr. 321) ♀ ad., Tomohon, 10. X. 94	141	70	43	41	21
c. (Saras. Coll. Nr. 239) ♀ ad., Tomohon, 1. IV. 94	143	68	43	41	20.5
d. (C 261) ad., Gorontalo (Riedel 1875) . . .	141	73	44	41	22
e. (C 13873) ad., Amurang, 16. XII. 94 (Nat. Coll.)	138	67	42	38	20

Nest. A nest labelled as belonging to this species is a slightly hollowed pad of pieces of dry bamboo-leaf and stalk, inartistically laid together (Tomohon, 23. IV. 94: P. & F. S.).

Distribution. Celebes and Sula: — Minahassa (Wallace *1*, Rosenberg *4*, etc.); Gorontalo Distr. (Riedel in Dresd. Mus.); West Celebes — Tawaya (Doherty *a 8*); Sula Islands (Allen *1*, Hoedt *4*).

This Rail is easily recognisable among all other Celebesian species by its dark ferruginous head, neck and breast, its comparatively short toes, these being shorter than the tarsus, and its small bill. It belongs to a group of five similar species composing the genus *Rallina*, which, as Dr. Sharpe shows, ranges from India through the East Indies to N. E. Australia. *R. minahassa* is most like *R. euryzonoides* (Lafr.) of the Philippines which has the bands on the underparts much broader (Sharpe's plate does not show this sufficiently), as also the white spots on the under wing-coverts and remiges; a somewhat further departure is *R. superciliaris* Eyt. of Ceylon, India and Malacca. The wide-spread *R. fasciata* (Rfl.), which ranges from Tenasserim to Borneo and Java — Sharpe says (Cat. B. XXIII, 76), apparently by mistake, to Celebes — re-occurs in Pelew, Buru and Halmahera; this bird has the upper wing-coverts barred with white.

Nothing has been recorded about the habits of *R. minahassa*. Dr. E. P. Ramsay (P. Z. S. 1875, 603) describes a nest of *P. tricolor* from Rockingham Bay, N. E. Queensland, as containing four eggs, pale cream or whitish in ground-

colour, with irregular-shaped spots of light reddish chestnut and a few underlying ones of lilac, like all true Rails' eggs. "The nest was composed of a few leaves and grass and hidden among thick débris at the root of a tree in a dense part of the scrub . . . The young on leaving the egg are covered with a sooty black down". *R. superciliaris* is a migratory species in Ceylon and Burmah, as shown by Legge and Oates. Col. Legge remarks upon its curious habit of concealing itself in all sorts of unexpected places (B. Ceylon, p. 774).

GENUS PORZANA Vieill.

Size small, from about that of a Lark to that of a Thrush. Hallux with claw about as long as the first phalanx of the inner toe. Middle toe and claw longer than the tarsus. Bill about as long as the cranium, or less, compressed, nasal groove not carried on to the terminal third; wing small to moderate, 2nd or 3rd quills longest; tail longer than tarsus.

301. PORZANA FUSCA (L.).

Ruddy Crake.

a. **Rallus fuscus** *(1)* Linn., S. N. 1760, I, 262 (ex Brisson).

b. **Rallus rubiginosus** *(1)* Temm., Pl. Col. Nr. 357 — fide Schlegel (fig. inacc.); *(2)* Bernst., J. f. O. 1861, 192.

c. **Gallinula erythrothorax** *(1)* Temm. & Schl., Faun. Jap. Aves 121, pl. LXXVII (1849 — Japan).

d. **Porzana erythrothorax** *(1)* Swinh., Ibis 1861, 57, 411; *(2)* David & Oust., Ois. Chine 1877, 486; *(3)* Stejn., Pr. U. S. Nat. Mus. 1886, IX, 398; *(4)* Styan, Ibis 1891, 329, 501.

Porzana fusca *(1)* Swinh., Ibis 1863, 426; *(2)* Jerd., B. Ind. III, 724 (1864); *(3)* Tweedd., Tr. Z. S. 1875, IX, 230; *(4)* id., P. Z. S. 1878, 344, 953; *(5)* Legge, B. Ceylon 1880, 769; *(6)* Hume, Str. F. 1880, IX, 118; *(7)* Oates, B. Brit. Burmah 1883, II, 346; *(8)* Stejn., Pr. U. S. Nat. Mus. 1886, IX, 399; *(9)* Reid, Str. F. 1887, X, 453; *(10)* Steere, List Coll. B. & M. Philipp. Is. 1890, 25; *(11)* Oates, ed. Hume's Nests & Eggs 1890, III, 396; *(12)* Munn, Ibis 1894, 77.

e. **Rallina fusca** *(1)* Schl., Mus. P.-B., Ralli, 1865, 20; *(2)* Salvad., Ucc. Borneo 1874, 388; *(3)* Hume, Str. F. 1875, III, 188, 500; *(4)* Vorderman, N. T. Ned. Ind. XLII, 1882, 108; *(5)* Everett, J. Str. Br. R. A. S. 1889, 202; *(6)* Vorderman, N. T. Ned. Ind. XLIX, 1890, 416.

f. **Gallinula rubiginosa** *(1)* Rosenb., Zool. Garten 1881, 167.

g. **Limnobaenus rubiginosus** *(1)* Sundev., Av. Meth. Tent. 1872, 130.

h. **Crex fusca** *(1)* Seeb., B. Japan. Emp. 1890, 357.

i. **Limnobaenus fuscus** *(1)* Sharpe, Cat. B. 1894, XXIII, 146, 338; *(2)* M. & Wg., Abh. Mus. Dresd. 1895 Mai, Nr. 8, p. 17; *(3)* Grant, Ibis 1895, 472; *(4)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 15.

For further synonymy and references cf. Sharpe *i 1.*

Figures and descriptions. Temminck *b I* (erroneous); Temminck & Schlegel *c I* (large race, Japan); Jerdon *2*; David & Oustalet *d 2*; Legge *5*; Oates *7*; Stejneger *d 3*; Vorderman *e 4*; Sharpe *i 1.*

Adult male. Above bistre with greenish reflection, browner on rump and tail, paler on wing-coverts and outer edges of remiges; head above chestnut, passing into bistre on the occiput; sides of head, fore-neck, breast vinaceous-rufous, browner on the face, whitish on chin and upper throat; sides of breast greenish bistre; flanks, and abdomen dusky olive, blackish on under tail-coverts, the whole barred with white; under wing-coverts and remiges below broccoli-brown, the former with white tips; "iris and edges of eyelids cherry-red; legs coral-red"; wing 94 mm; tail 42; tarsus 33; middle toe with claw 35; bill from lores 19.5 (♂, Tondano, N. Celebes, 11. XI. 94: Sarasin Coll., Nr. 335).

Young. "Above uniform dark olive, with a slight tinge of vinous on the forehead and above the eye; sides of face dusky brown; throat white; fore-neck and remainder of under surface whitish, barred with dusky olive; the sides of body, flanks and thighs uniform dark olive; under tail-coverts black, broadly barred and tipped with white; under wing-coverts dark olive edged with white" (Sharpe *i 1*).

Eggs. Swinhoe says 7 or more; moderately broad ovals, sometimes rather pointed; pinky or creamy white, streaked, spotted and blotched chiefly at the large end with brownish red or reddish brown, pale inky-purple spots intermingled; the markings varying in different eggs from deep red to dull brown: size 29.5—32.3 × 20.3—22.6 mm (Hume *11*: see, also, Swinhoe *1* and Bernstein *b 2*).

Nest. A reed-formed nest at the roots of rushes (Swinhoe). Formed of weeds and grass, reed or rush (Hume).

Distribution. India — South, Central and N. W. Provinces, the Punjab, Rajpootana — rare, Bengal (Hume *11*); Cashmere (Stoliczka *5*); Ceylon (Legge *5*); Burmah (Blyth, Oates *7*); Tenasserim (Brit. Mus. *i 1*); South and Central China (Swinhoe *d 1*, David *d 2*, Styan *d 3*); Japan (T. & S. *c 1*, Pryer etc. *h 1*, *i 1*); Formosa (Swinhoe *1*, *i 1*); Malay Peninsula (Hume & Davison *6*, *i 1*); Sumatra (S. Müller *e 1*, *e 6*); Java (Reinwardt *e 1*, Bernstein *b 2*, etc.); Borneo (Schwaner *e 1*); Philippines (Brisson *a 1*, Cuming *e 1*); Luzon (Steere *10*, Whitehead *i 3*); Leyte (Everett *4*); Mindanao (Everett *4*, Steere *10*); Celebes — Minahassa (P. & F. S.); ?Limbotto (v. Rosenb. *f 1*); Macassar (P. & F. Sarasin *i 4*).

A single male example of the Ruddy Crake was obtained by the Drs. Sarasin at Tondano in November, 1894, and a male and two females at Macassar in September, 1895. It had previously been recorded from the island by von Rosenberg *(f 1)* from Limbotto, but his identifications cannot always be trusted, though in this case probably right. The record had hitherto been overlooked by us. The Sarasins' specimens are small, like those of Java. Individuals from Japan and China are stated to be of larger size by Schlegel, Seebohm, Sharpe and others, and the first-named recognised them as a distinct species, *P. erythrothorax*; the separation is upheld by Dr. Stejneger *(d 3)*. We believe, with Dr. Sharpe, that specific separation is impossible, chiefly because the supposed species are not stationary everywhere. Mr. Styan *(d 4)* considers it a summer visitor to the Lower Yangtse; in winter, therefore, the Chinese birds must be found in the Siamese Peninsula or the East India Islands. To the Lucknow Division it is a cold weather visitant, according to Reid *(9)*; and Legge found it to be a winter migrant to Ceylon. Oates describes it as a constant resident in Burmah. In India Hume makes the

interesting observation that it is almost exclusively confined to the moister portions of the Empire where the rainfall exceeds 40 inches. Swinhoe found it breeding in Formosa, and Bernstein discovered its nest in Java; Vorderman remarks that it is to be met with throughout the year in the grass-lands and sawahs around Batavia. We are inclined to regard it as a winter visitor to Celebes, but the species is of concealed habits, and closer research by naturalists travelling there is required before anything like knowledge can be pretended to.

A very dark example with white spots on the outermost primary from one of the southern islands of the Loochoo Group has been separated by Dr. Stejneger as *P. phaeopyga*. Another allied form is *P. paykulli* (Ljungh), ranging from E. Siberia south to Borneo, a larger bird, with an ashy brown upper surface and broad white bars on the flanks and under tail-coverts. In Australasia the wide-spread *P. tabuensis* (Gm.) has certain affinities with *P. fusca*; here the vinaceous rufous of the under-parts are replaced by slaty.

Bernstein describes the Ruddy Crake in Java as being partial to the same localities as *Hypotaenidia striata*, but, owing to its concealed and quiet mode of life, he rarely saw the bird in nature. In Ceylon Col. Legge found it "on the borders of streams and damp sedgy spots". He has also encountered it in a wood, where it flew a short distance and perched on a low tree. Mr. Oates writes that in Burmah it "is the only one of the Crakes which can be said to be at all common. It frequents all sorts of jungle, provided there is water about; and it comes out into the open rather frequently".

GENUS LIMNOCORAX Ptrs.

There seems to be little to distinguish this genus from *Porzana*, except its comparatively long hallux, which with the claw is about 1½ times the length of the first phalanx of the inner toe, but it is also easily distinguished from the small Crakes by its entirely black plumage. The single species of the genus belongs to Africa, but has been obtained also in Celebes.

302. LIMNOCORAX NIGER (Gm.).

African Black Crake.

a. **Rallus niger** *(1)* Gm., S. N. 1788, I, 717 (ex Latham).
b. **Gallinula flavirostra** *(1)* Swains., B. W. Afr. 1837, II, 244, pl. 28.
c. **Ortygometra nigra** *(1)* Gray, List Grallae Brit. Mus. 1844, 118; *(2)* Böhm, J. f. O. 1882, 186; *(3)* Meyer, Isis, Dresden 1884, 53; *(4)* Büttik., Notes Leyden Mus. 1885, VII, 245.
d. **Limnocorax flavirostris** *(1)* Hartl., J. f. O. 1854, 301; *(2)* Gurney, Ibis 1862, 35; *(3)* Meyer, J. f. O. 1873, 405; *(4)* id., J. f. O. 1883, 149; *(5)* W. Blas., ib.
e. **Ortygometra flavirostris** *(1)* Pelz., Verh. z.-b. Ges. Wien 1875, 47; *(2)* Cabanis, J. f. O. 1883, 150.

Limnocorax niger *(1)* Gurney, Ibis 1868, 470; *(2)* Sharpe, Cat. B. 1894, XXIII, 150; *(3)* R. & J. Woodward, Ibis 1897, 401.

For further synonymy and references cf. Sharpe *2*.

Figure and descriptions. Swainson *b I*, Sharpe *2*.

Adult. Black, with a slaty tone on mantle, wing-coverts and under-parts, a brown tone on lower back and scapulars; "iris and eyebrows crimson, bill yellowish grass-green, feet coral red" — Büttik. *c 4* (Cape — Nr. 11476).

Sex. The sexes are alike in coloration.

Young. "Chocolate-brown, instead of black like the adult, with a little ashy grey, showing the adult plumage; lores and feathers above and below the eye whitish; under surface of body ashy grey, whiter on the cheeks and throat" (Sharpe *2*).

Chick. Jet-black, covered with hairy down, pointed with white in very young specimens on the head, especially on the chin; terminal half of upper and lower bill shining wax-white, base of latter black; cutting edge of upper bill wax-black continued to the gape, a shield of deep flesh-colour (from Böhm *c 2*).

Eggs. Apparently 2—6 in number; light yellow-brown, sprinkled with finer and larger spots of dark brown: size 41—44 × 29—30 mm (from Böhm).

Nest. Round, flat, somewhat inartistically fashioned of rush stalks; one found by Reichard in a clump of grass a foot above the water (Böhm).

Distribution. Nearly the whole of Africa (Sharpe *2*); North Celebes (Meyer *d 3*, *c 3*).

An example of this African Crake was killed by Meyer near Manado in March, 1871. The record is surprising, but there appears to be no reason to doubt the accuracy of the locality, as Cabanis has done *(e 2)* on grounds believed by Meyer *(c 3)* to be insufficient. Rails have a knack of finding themselves in all sorts of out-of-the-way places, and there is nothing more unusual in the occurrence of *Limnocorax niger* in Celebes than in that of *Hypotaenidia philippensis* in Mauritius, of *Amaurornis cinerea* in the Carolines, of *Porzana tabuensis* in New Zealand and Australia as well as Polynesia. A particularly good parallel among other birds is the occurrence of *Scops manadensis* of Celebes (or a scarcely separable race of it) in Madagascar, which again may be compared with König's discovery of a small Cuban Owl *(Glaucidium siju)* in the Canaries (J. f. O. 1890, 336).

For remarks on the habits of the Black Crake, Ayres *(d 2, 1 etc.)*, Böhm *(c 2)* and Büttikofer *(c 4)* may be consulted. The last-named observer writes that he never saw it swimming in Liberia, and Dr. Böhm in E. Africa hardly ever saw it in water, or on the wing. It is wary, hasting to concealment by running when alarmed, but sometimes it may be seen walking "with a most graceful step and nodding head on the mud and, as much as possible, beside and through the high grass" (Büttikofer). Several nests with eggs and young were found by Dr. Böhm, as described above.

GENUS AMAURORNIS Rchb.

Bill equal to or slightly longer than the cranium, compressed, high — about twice as high as broad across the nostrils, slightly swollen at the base

in front of the forehead; tarsus equal to or shorter than the middle toe and claw, hallux with claw comparatively large, longer than the first phalanx of the inner toe; wing somewhat small, tip formed by 2nd to 5th quills, 3rd and 4th usually slightly the longest; tail very small, about as long as the tarsus. The long hallux, longer toes and different quill-formula serve to distinguish this genus from *Rallina*, the absence of a frontal shield from *Gallinula*, the long hallux from *Porzana*.

303. AMAURORNIS CINEREA (Vieill.).

White-eyebrowed Water-crake.

a. **Porphyrio cinereus** *(1)* Vieill., Nouv. Dict. 1819, XXVIII, 29; *(2)* Pucheran, Rev. Zool. 1851, 563.

b. **Rallus quadristrigatus** *(1)* Horsf., Tr. Linn. Soc. 1821, XIII, 196.

c. **Zapornia sandwichensis** *(1)* Rchb. (nec Gm.), Handb. Fulic., Taf CXIX, figs. 1184—85 (1846).

d. **Porzana leucophrys** *(1)* Gld., B. Austr. 1848, VI, pl. 81; *(II)* Rchb., Fulic. Novit., Taf. XLII, figs. 2469—70.

e. **Porzana quadristrigata** *(1)* Blyth, Cat. B. Mus. As. Soc. 1849, 284; *(2)* Seebohm, Ibis 1891, 191.

f. **Porzana cinerea** *(1)* Schl., Mus. P.-B., Ralli, 1865, 32; *(2)* Rosenb., Malay. Archip. 1878, 278; *(3)* Hume, Str. F. 1878, VII, 440, *(4)* id., ib. 1879, VIII, 70; *(5)* Kelham, Ibis 1882, 188; *(6)* W. Blas., J. f. O. 1883, 125, 127; *(7)* Ramsay, Tab. List 1888, 21; *(8)* Tristr., Cat. Coll. B. 1889, 28.

g. **Erythra quadristrigata** *(1)* Gld., HB. B. Austr. 1865, II, 343; *(II)* North, Nests and Eggs Austr. B. 1889, 332, pl. XVI, fig. 7 (egg).

h. **Ortygometra quadristrigata** *(1)* Finsch, Neu-Guinea 1865, 181; *(2)* Finsch & Hartl., Orn. Centralpol. 1867, 164; *(3)* Nehrk., J. f. O. 1879, 408; *(4)* E. L. & E. L. C. Layard, Ibis 1882, 537, 544; *(5)* Hartert, Kat. Vog. Senckenb. Mus. 1891, 212.

i. **Ortygometra cinerea** *(1)* Wald., Tr. Z. S. 1872, VIII, 94; *(2)* Salvad., Cat. Ucc. Borneo 1874, 339; *(3)* id., Ann. Mus. Civ. Gen. 1875, VII, 677; *(4)* Brügg., Abh. Ver. Bremen 1876, V, 92; *(5)* Tweedd., P. Z. S. 1877, 767; 1878, 114, 344, 953; *(6)* Meyer, Ibis 1879, 142; *(7)* Salvad., Orn. Pap. III, 1882, 373; *(8)* W. Blas., J. f. O. 1883, 139; *(9)* id., ib. 1884, 215, 218, 222; *(10)* Kutter, J. f. O. 1884, 225; *(11)* id., ib. 1885, 353; *(12)* W. Blas., Ztschr. ges. Orn. 1886, 158; *(13)* Büttik., Notes Leyden Mus. 1887, IX, 6, 80; *(14)* Everett, J. Str. Br. R. A. S. 1889, 202; *(15)* Steere, List Coll. B. & M. Philipp. Is. 1890, 25; *(16)* Vorderman, N. T. Ned. Ind. 1890, XLIX, 416; *(17)* Sh. & Whitehd., Ibis 1890, 145; *(18)* Sharpe, ib. 285; *(19)* Meyer, ib. 424; *(20)* Salvad., Ann. Mus. Civ. Gen. 1891, (2) XII, 76; *(21)* Wiglesw., Av. Polyn. 1892, 61; *(22)* Büttik., Zool. Erg. Weber's Reise Ost-Ind. 1893, III, 282; *(23)* M. & Wg., J. f. O. 1894, 252; *(24)* iid., Abh. Mus., Dresd. 1895, Mai, Nr. 8, p. 17.

j. **Zapornia quadristrigata** *(1)* Vorderman, N. T. Ned. Ind. 1883, XLIII, 122.

k. **Phalaridium quadristrigatum** *(1)* Heine & Rchw., Nomencl. Mus. Hein. 1890, 319.

l. **Poliolimnas**[1]) **cinerea** *(1)* Sharpe, Bull. B. O. C. 1893, Nr. V, p. 28; *(2)* id., Cat. B. XXIII,

[1]) In creating for this species the peculiar genus *Poliolimnas*, the author of the Catalogue of the Rails compares it with the genus *Porzana*, and makes the erroneous statement that the secondaries are equal to the

1894, 130, 337; *(3)* Bourns & Worces., B. & M. Menage Exped. 1894, 30; *(4)* Hart., Nov. Zool. 1896, 180.

m. ? **Gallinula superciliaris** *(1)* Rosenb., Zool. Garten 1881, 167; *(2)* Joest, Holontalo 1883, 106.

Amaurornis cinerea *(1)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 6.

"Tuwiel", Minahassa, Nat. Coll.

"Tatao" (?), Gorontalo, Joest *m 2*.

"Tamaroro", or **"Tenggok"**, Talaut, Nat. Coll. *i 23*.

For further synonymy and references cf. Salvadori *i 7*; Wiglesworth *i 21* (Polynesia); Sharpe *l 2*.

Figures and descriptions. Gould *d I, g 1*; Reichenbach *c 1, d II*; Schlegel *f 1*; Finsch & Hartlaub *h 2*; Salvadori *i 7*; Vorderman *j 1*; Sharpe *l 2*.

Adult male. Above hair-brown, more bistre on lower back, more broccoli-brown on the wing-coverts, all the feathers with darker centres, blackish centres on back, scapulars, inner remiges, rump, upper tail-coverts, and tail; head above slaty grey, becoming dark hair-brown in the middle, as on hind neck; supraloral region white; around the eyelid, lores and feathers at base of lower bill black; malar stripe, passing under the eye and above the ear-coverts white; ear-coverts ashy bistre; under surface white, light grey on jugulum and sides of breast, blending with the hair-brown of the hind neck; flanks isabelline, browner on lower sides and outside of thighs, more buff on under tail-coverts; under wing-coverts drab, tips of these and edge of wing whitish; quills below paler drab; "iris lake; bill yellow [greenish yellow], the under mandible tinged with lake at the base; feet dull olive-green" — Whitehead (♂, Kema, 11. IX. 93: P. & F. Sarasin).

Female. Smaller than the male, and, apparently, with a less black tone on the head, and the black loral stripe narrower and less intense (W. Blasius *i 12*).

Young. Lighter brown above than the adult; no grey on the head or under-parts; lores not black; white supraloral and malar stripe obscurely indicated; sides fulvous brown; abdomen buffy white; under wing-coverts with more white (Kabruang, Talaut, Nov. 1893: Nat. Coll. — C 13044).

Measurements. (14 adults: N. Celebes) wing 93—111 mm, (6 adults: Talaut) wing 93—96; tail ca. 50 mm; tarsus (Celebes) 36—41, (Talaut) likewise 36—41; middle toe with claw ca. 45—48; bill from feathers of forehead 21—24.

Eggs. "Dr. Platen sent me several eggs from Rurukan in the Minahassa which are like those in my possession from islands of the South Seas. The ground-colour is grey-yellow; the numerous small light brown spots are distributed equally over all the eggs, so that some of them appear uniform in colour. They resemble the eggs of our Blackbird, *Turdus merula*, save that the ground-colour is grey-yellow instead of bluish. The measurements are: 30—32.5 × 22.5—23 mm" (Nehrkorn MS. — see, also, Nehrk. *h 3*, North *g 2*, with fig., Kutter *i 10*, *i 11*).

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primaries. The bird is, however, a Water-hen, having little affinity with *Porzana*, but differing in structure in no way whatever, so far as can be seen, from *Amaurornis (Erythra) phoenicura*, as Gould was already aware; and the affinity is further proven by its characteristic egg, which is sometimes a miniature of the egg of that species *(i 11)*. It may also be mentioned here that the Celebesian *Amaurornis isabellina* is erected to a new genus *Oenolimnas* by Dr. Sharpe, who compares it with *Crex*, with which in our opinion it has nothing to do; on the other hand it appears impossible to separate it from *Amaurornis:* we can see no single structural difference by which to do so. Further, Sundevall's genus *Limnobaenus* is upheld for *Porzana fusca:* this bird differs pretty widely from *P. maruetta*, the type of *Porzana*, but between it and certain of the little Crakes, such as *P. tabuensis*, we can see nothing sufficient to warrant generic separation.

Nest. A loose, flat basin of rush-leaves, lined with fine grasses: 7 cm diam., 3.5 cm in depth; found on the ground. A second nest was built of the leaves of rice-straw (Kutter *i 11*, after examples obtained by Grabowsky in Borneo).

Distribution. Malacca (Maingay *l 2*), Penang (Cantor *l 2*), Singapore (Davison *l 2*, *f 4*, Kelham *f 5*); Sumatra (Klaesi *i 13*, Modigl. *i 20*); Java (Horsfield *b 1*, Boie *f 1*, etc.); Borneo (Grabowsky *i 9*, *i 11*, Breitenstein, Everett *i 14*); Philippines — Luzon, Guimaras, Panay, Mindoro, Cebu, Negros, Dinagat, Leyte, Siquijor, Marinduque, Mindanao, Basilan (Everett *i 5*, Steere *i 15*, Bourns & Worcester *l 3*); Talaut — Karkellang, Kabruang and Salibabu (Nat. Coll. in Dresden Mus. *i 23*); Celebes — Minahassa (Meyer *i 6*, Fischer *i 4*, etc.), Gorontalo Distr. (Forsten *f 1*, v. Rosenberg *f 1*, etc.), Macassar (Weber *i 22*); Djampea (Everett *l 4*); Timor (Wallace *i 2*, *l 2*); Moluccas — Buru (H. O. Forbes *l 2*), Halmahera (Bernstein *f 1*, *i 7*), Amboina (Hoedt *f 1*, *i 7*); Papuasia — Kei, New Guinea, Duke of York (fide Salvadori *i 7*), New Britain (Kubary *i 19*); Is. of Torres Straits (Macgillivray *i 7*); North Australia and Queensland (Gould *d I*, *g 1*, Ramsay *f 7*); Polynesia — Pelew Is., Caroline Is., New Caledonia, Loyalty Is., New Hebrides, Fiji Is., Samoa Is. (f. Finsch & Hartlaub *h 2*, Wiglesw. *i 21*).

This little Water-crake ranges over a vast area — from Penang to Queensland, and from the Philippines to Samoa, but no local races of it are known, unless it be that Bornean birds are a trifle smaller than Celebesian ones, as is inferred by W. Blasius, and Philippine birds greyer on the breast, as is remarked by Sharpe. Salvadori points out that its range may be compared to that of *Hypotaenidia philippensis*, though that species does not occur quite so far west, nor, it may be added, *A. cinerea* so far south in Australia and Polynesia; for instance, it is not known from New Zealand. Like *H. philippensis* it has undoubtedly extended its range by flight; it swims well, and has for a Rail well developed wings, though Kelham *(f 5)* describes it as having the habit of flying for fifty yards with a weak flight, trailing its legs behind it, then dropping and skulking. To what country or island it may have originally belonged, it is unprofitable to hazard a guess.

It is a very distinct species, easily distinguished from *Porzana (Ortygometra)* by its having the culmen and sides of the maxilla much thickened at the base, and by its very long toes, especially the hallux. It may be termed a small edition of *Amaurornis phoenicura* (Penn.) which occurs in many localities in common with it; *A. phoenicura* may be distinguished by its great size, its brownish slaty upper surface and sides, its white face, throat and breast.

Mr. Layard and his son, Mr. E. L. C. Layard, describe it as inhabiting grassy swamps in New Caledonia, where it swims and dives with facility. Lieutenant Kelham found it plentiful in the deepest part of the inodorous, swampy grass-fields near Singapore: "nearly every bush held one". In Australia Gould describes it as a somewhat familiar bird: "it will frequently run up a branch, turn round, gaze at the intruder, and utter its very singular loud and chattering cutche, cutche, with but little apparent alarm". Gould found its food to be insects, worms, slugs, leaves of aquatic plants, obtained either in

the marshes or by swimming, "which it can do as perfectly as the Moor-hen, Gallinule and the little *Porzanae*"; Kelham shot a female with the stomach full of grass-seeds, a fine thread-like weed, and a quantity of sand. About the inland lakes of Celebes, such as Tondano and Limbotto, it seems to be a very plentiful species.

304. AMAURORNIS PHOENICURA (Forst.).

White-breasted Water-hen.

a. **Rallus phoenicurus** *(I)* Forster, Zool. Ind. 1781, 19, pl. 9 (Ceylon).

b. **Gallinula leucomelaena** *(1)* S. Müll., Verh. Natuurk. Comm. 1839—44, 158 (Timor).

c. **Gallinula phoenicura** *(1)* Gray, Gen. B. III, 599 (1845); *(2)* Swinh., Ibis 1863, 427; *(3)* Schl., Mus. P.-B., Ralli, 1865, 41; *(IV)* Gould, B. Asia VII, pl. 67 (1872); *(5)* Aitken, Str. F. 1873, I, 424; *(6)* Hume & Davis., Str. F. 1878, VI, 466; *(7)* Rosenb., Malay. Archip. 1878, 278; *(8)* id., Zool. Garten 1881, 167; *(9)* Vorderm., N. T. Ned. Ind. 1882, XLII, 112; *(10)* Tristr., Cat. Coll. B. 1889, 27; *(11)* Styan, Ibis 1891, 329, 501; *(12)* Vorderm., N. T. Ned. Ind. 1895, 322; *(13)* Jesse, Ibis 1896, 192, 198.

d. **Porzana phoenicura** *(1)* Blyth, Cat. Mus. Asiatic Soc. 1849, 284; *(2)* Schomb., Ibis 1864, 261.

e. **Erythra phoenicura** *(I)* Rchb., Handb. Fulic., 1852, p. XXI, t. 192, figs. 1116—1117; *(2)* Wald., Tr. Z. S. 1872, VIII, 94; *(3)* Salvad., Ucc. Borneo 1874, 340; *(4)* id., Ann. Mus. Civ. Gen. 1875, VII, 679; *(5)* David & Oust., Ois. Chine 1877, 486; *(6)* Oates, Str. F. 1877, V, 165; *(7)* Salvad., Ann. Mus. Civ. Gen. 1879, XIV, 253; *(8)* Meyer, Ibis 1879, 142; *(9)* Legge, B. Ceylon 1880, 786; *(10)* Wardl. Rams., Tweedd. Orn. Works, Index 1881, 659; *(11)* Kelham, Ibis 1882, 188; *(12)* A. Müller, J. f. O. 1882, 438, 441; *(13)* Parker, Ibis 1883, 194, 195; *(14)* W. Blasius, J. f. O. 1883, 139; *(15)* Guillem., P. Z. S. 1885, 273, 560; *(16)* Büttik., Notes Leyden Mus. 1887, 80; *(17)* Everett, J. Str. Br. R. A. S. 1889, 202; *(18)* Oates ed. Hume's Nests & Eggs Ind. B. 1890, III, 391; *(19)* Steere, List Coll. B. & M. Philipp. 1890, 25; *(20)* Sharpe & Whitehead, Ibis 1890, 145; *(21)* Hagen, T. Ned. Aard. Genoots. 1890, (2) VII, 165; *(21bis)* Vorderm., N. T. Ned. Ind. 1890, L, 407; *(22)* De La Touche, Ibis 1892, 495; *(23)* Oust., Bull. Soc. Philom. 1892 (8) IV, 118; *(24)* Hose, Ibis 1893, 423; *(25)* Büttik., Weber's Reise 1893, III, 282, 289; *(26)* M. & Wg., J. f. O. 1894, 252; *(27)* Hartert, Novit. Zool. 1894, 483; *(28)* id., ib. 1896, 166, 180.

f. **Erythra leucomelaena** *(1)* Bp., C. R. 1856, XLIII, 600; *(2)* Blas. & Nehrk., Jb. Naturw. Braunschw. 1881, 60; *(3)* Guillem., P. Z. S. 1885, 511.

g. **Ortygometra phoenicura** *(1)* Finsch, Neu Guinea 1865, 181.

Amaurornis phoenicura *(1)* Sundev., Av. Meth. Tent. 1872, 132; *(2)* W. Blas., Zt. ges. Orn. 1885, 311; 1886, 158; *(3)* id., J. f. O. 1885, 402; *(4)* Stejn., Pr. U. S. Nat. Mus. 1886, 405; *(5)* W. Blas., Ornis 1888, 319; *(6)* Sharpe, Ibis 1894, 243, 257; *(7)* id., Cat. B. 1894, XXIII, 156; *(8)* Bourns & Worces., B. & M. Menage Exped. 1894, 30; *(9)* M. & Wg., Abh. Mus. Dresd. 1895, Mai, Nr. 8, p. 17; *(10)* Bütt., Notes Leyd. Mus. 1896, XVIII, 193; *(11)* Hart., Nov. Zool. 1897, 165.

h. **Gallinula phoenicura** var. **leucomelaena** *(1)* Brügg., Abh. Ver. Bremen 1876, V, 91.

i. **Amaurornis leucomelaena** *(1)* Salvad., Orn. Pap. 1882, III, 278.

j. **Erythrura phoenicura** *(1)* Oates, B. Brit. Burmah 1883, II, 348.

"Buluwao", Gorontalo, Joest, Holontalo 1883, 106.
"Bulo vaha" [Gorontalo Distr.], Rosenb. *c 7*.
"Weres", (Rail) Malay, Minahassa, Meyer *e 8*.
"Terwowok", Minahassa, Meyer *e 8*.
"Sarem wokwok", Minahassa, Guillem. *e 15* or **"Saring wokkok"**, Nat. Coll.
"Prodro", Tjamba Distr., Platen *2*.
"Marohak", Tagulandang Id., Nat. Coll.
"Teingkelana", Kabruang, Talaut, Nat. Coll.

For further synonymy and references cf. Sharpe *7*.

Figures and descriptions. Gould *c IV*; Forster *a I*; Reichenbach *e I*; David & Oustalet *e 5*; Legge *e 9*; Vorderman *c 9*; Salvadori *i 1*; Oates *j 1*; Stejneger *4*; Sharpe *7*.

Adult male. Upper surface, with sides of neck and of body olivaceous slaty, browner on back and greater wing-coverts, becoming pure bistre on rump and tail, most slaty on sides of jugulum and of body, with a broad blackish border on the former part; some of the feathers of the back with pale terminal margins; face, including lores and superciliary region, throat and under-parts white, less pure on abdomen, becoming deep cinnamon on flanks and under tail-coverts; under wing-coverts slaty, the inner and longer ones paler, with whitish tips; "iris brown-red; feet yellow; bill yellow-greenish, above and at the base red" (♂, Kema, 21. VII. 93: P. & F. Sarasin).

Wing 158 mm; tail 58 ca.; tarsus 52 ca.; mid. toe 67; bill from feathers of forehead 39.

Female. Similar to the male in coloration. Wing 147 mm; tail 64; tarsus 53; mid. toe 63; bill 34 (♀, Kema, 28. X. 93: P. & F. Sarasin).

According to Sharpe the female is slightly smaller than the male.

Old bird. Legge states that the white encroaches on to the forehead more and more with age; one example in the Dresden Museum — land of origin unknown — has a white frontlet 9 mm broad.

Immature. Less slaty, and browner above than the adult, without the black border on the sides of the neck; lores and face dusky, mixed with white (Minahassa: Faber — C 3563).

Young. "When first hatched the chick is covered with black down. After leaving the nest, and following the parent, the back becomes edged with pale brownish; a stripe on each side of the chin and the sides of the belly whitish; wing-coverts and breast with faint light bars; sides of the rump and under tail-coverts rufescent" (Legge *e 9*).

Eggs. "All the eggs in my collection display in general the Ralline character, nevertheless they differ greatly among themselves. The ground-colour is grey-yellow, with spots of violet, light grey, and dark brown, which are completely washy in many examples. The measurements are: 41 × 31 mm" (Nehrkorn MS.). See, also, Hume *e 18*, from whose statements 6—8 would appear to be the full complement of eggs (Aitken *c 5*, Legge *e 9*, Swinhoe *c 2*).

Nest. "Placed between bushes in pools of water" (Celebes — Meyer *e 8*). Mr. Aitken *(c 5)* found the bird breeding in a nest in a date palm-tree, which might have been a Crow's; Mr. Oates says it usually builds in stunted trees in Burmah; it has also been found building floating nests of reeds *(e 18)*.

Distribution. Almost throughout India (Hume *e 18*); Ceylon (Legge *e 9*); Burmah (Oates *j 1*); Tenasserim (Davison *c 6*, etc.); Great Coco Id. (Davison *7*); South and Central China (Swinhoe *e 3*, *7*, David *e 5*, Styan *c 11*); Formosa (Swinhoe *c 2*, *7*); Cochin China (Pierre *7*); Siam (Schomburgk *d 2*, *7*, Layard *7*); Malay Peninsula (Cantor *7*,

etc.); Salanga (J. Weber *e 12*); Singapore (Kelham *e 11*); Sumatra (S. Müller *c 3*, Beccari *e 7*, etc.); Banka (v. d. Bossche *c 3*); Noordwachter Id. (Vorderman *c 12*); Nias (Kannegieter *10*); Java (Horsfield *e 3*, Bocarmé *c 3*, etc.); Natuna Is. — Sirhassen (Everett *e 27*); Borneo (Diard, Mottley, etc. *e 17*); Philippines — Palawan, Calamianes, Mindoro, Siquijor, Marinduque, Mindanao, Basilan, Sooloo, Tawi Tawi, Bongao (Platen *5*, Bourns & Worcester *8*, Everett *e 10*, *6*, Guillemard *e 15*, Steere *e 19*); Talaut Is. — Kabruang (Nat. Coll. *e 26* in Dresd. Mus.); Sangi Is. — Tagulandang (Nat. Coll. in Dresd. Mus.); Celebes — Minahassa (Wallace *7*, Meyer *e 8*, etc.), Gorontalo Distr. (Forsten *c 3*, Rosenberg *c 3*, etc.), Dongala, West Celebes (Doherty *11*), Kandari, S. E. Celebes (Beccari *e 4*), South Celebes (Reinwardt *c 3*, Wallace 7, Platen *2*, Weber *e 25*); Saleyer Id. (Weber *e 25*, Everett *e 28*); Sumbawa (Guillem. *f 3*, *7*); Timor (S. Müller *b 1*, *c 3*, Wallace *i 1*, *7*); Buru (Bruijn *i 1*, Leyden Mus. *i 1*).

The White-breasted Water-hen seems to be a very common species almost throughout its range, but, owing to its skulking habits, it is more often heard than seen. Its voice is a most remarkable one, and authors have found some strange similies for it; Mr. Oates compares it to the braying of an ass; Mr. Aitken speaks of it as beginning with loud harsh roars, "which might have been elicited from a bear by roasting it slowly over a large fire", suddenly changing to a clear note, repeated like the coo of a Dove; while Colonel Legge says that it might startle a stranger in the night into thinking that some one was being strangled beneath his windows. Its Alfurous name in the Minahassa, "Saring wokwok", is taken from its cry.

In some parts of its range it is not stationary; thus, it visits the Lower Yangtse Basin, as Mr. F. W. Styan, remarks, in summer, yet in South China Mr. De La Touche says it is resident. Mr. T. Parker *(e 13)* found that a local migration of this among many other species takes place in N. W. Ceylon after the breeding season, in consequence of the drying-up of the tanks.

The Timor birds have been separated as a distinct species, *A. leucomelaena* by Salomon Müller; it is said by Schlegel to have the black extended on to the forehead and sides of the head, and much more spread out towards the lower neck and middle of the breast and belly. The species was admitted by Count Salvadori, but it is not allowed to stand by Dr. Sharpe, and the unsatisfactory nature of its characters may be judged from the fact that it has been recorded by Brüggemann and W. Blasius from Celebes and Borneo, where *A. phoenicura* is found by others. According to Legge the species varies considerably. The existence of local races on the main islands must for the present be held not proven. The Andamans and Nicobars, however, according to Sharpe, harbour a dark race, named by him *A. insularis*.

Elsewhere, this wide-spread Water-hen has no near allies, its white face and breast easily distinguishing it from the other members of its genus. Its habits are well described in Legge's "Birds of Ceylon" *(e 9)*.

305. AMAURORNIS MOLUCCANA (Wall.).

Plumbeous-breasted Water-hen.

a. **Gallinula olivacea** *(1)* Schl. (nec Meyen), Mus. P.-B., Ralli, 1865, 43.

b. **Porzana moluccana** *(1)* Wall., P. Z. S. 1865, 480.

c. **Gallinula ruficrissa** *(1)* Gould., Ann. & Mag. N. H. 1869, (4) IV, 110; *(II)* id., B. Austr. Suppl. pl. 79 (1869); *(3)* Ramsay, Tab. List 1888, 21; *(4)* North, Nests & Eggs B. Austr. 1889, 326.

d. **Gallinula frankii** *(1)* Schl., Notes Leyden Mus. 1879, I, 163.

Amaurornis moluccana *(1)* Salvad., Atti Ac. Sc. Tor. 1879, XIV, 944; *(2)* id., Orn. Pap. 1882, III, 276; *(3)* Meyer, Isis, Dresden 1884, 6, 55; *(4)* W. Blas., Ornis 1888, 638; *(5)* Heine & Rchw., Nomencl. Mus. Hein. 1890, 317; *(6)* Salvad., Agg. Orn. Pap. 1891, 197; *(7)* Sharpe, Cat. B. 1894, XXIII, 153, 338; *(8)* Madar., Aquila 1894, 105.

For further synonymy and references cf. Salvad. *2*, *6*; Sharpe *7*.

Figure and descriptions. Gould *c II*; Wallace *b 1*; Schlegel *d 1*; Salvadori *2*; Sharpe *7*.

Scarcely adult. Above olive-bistre, brighter on rump, tail and scapulars; jugulum, breast and sides plumbeous mouse-grey, paler and browner on face, whitish on chin and upper throat; abdomen white, passing into cinnamon on the under tail-coverts, darker and browner on flanks and thighs; under wing-coverts and remiges below brownish slaty (Siao: Meyer — C 889). "Iris brown; cere green; bill and feet brown" (Batjan — Platen). Another specimen labelled "Sangir Id." (collector unknown — C 10508) is adult and has the sides of the body browner.

Three examples from the Moluccas (1 Halmahera, 1 Batjan) have the throat slaty like the breast. A whitish throat is held by Dr. Sharpe to be a sign of immaturity.

Measurements.	Wing	Tail	Tarsus	Mid. toe	Bill from forehead
a. (C 889) vix ad., Siao (M.)	147	57	52	58	27
b. (C 10508) ad., "Sangir Id."	145	50	60	64.5	32
c. (C 891) ♀ ad., Halmahera (M.)	141	56	50.5	53	29.5
d. (C 6876) ♂ ad., Batjan, 1. VIII. 84 (Platen) .	146	58	53.5	57.5	31
e. (C 12455) ad., "Moluccas" 1867	142	59	56	61	31.5

The species shows great variation in size.

Egg. Dull white, finely freckled all over with light chestnut-red markings, a few subjacent ones nearly obsolete: 40.6 × 30.5 mm (New Britain — ex North *c 4*).

"The eggs from New Britain resemble those of *Rallus aquaticus*, except that they are somewhat more strongly spotted, and measure 39 × 28 mm" (Nehrkorn MS.).

Distribution. Siao (Meyer *3*); Moluccas — Halmahera, Ternate, Tidore, Batjan, Amboina (f. Salvadori *2*); Papuasia — Mysol, New Guinea, Duke of York, New Britain (f. Salvad. *2*); Sta. Anna, Solomon Is. (Macdonald *6*); Queensland (Ramsay etc. *c 3*).

The occurrence of this Water-hen in the Island of Siao may be compared with that of *Columba albigularis*, a species of somewhat similar distribution, which has straggled to Tagulandang. The Siao skin, as Meyer has already pointed out *(3)*, shows certain differences, but these, as was then suggested, may be due to immaturity; the specimen is not fully adult.

A. moluccana is closely related to *A. olivacea* of the Philippines, which is larger, darker, and has the under-parts slaty grey, except the under tail-coverts, which are rufous brown.

* 306. AMAURORNIS ISABELLINA (Schl.).

Isabelline Water-hen.

Plate XLIII.

[**Gallinula isabellina** Temm. MS.]

a. **Euryzona isabellina** *(1)* Bp., Compt. Rend. 1856, XLIII, 599, Nr. 346 (descr. null.).

b. **Rallina isabellina** *(1)* Schl., Mus. P.-B., Ralli, 1865, 16, 78; *(2)* Gray, HL. 1871, III, 58, Nr. 10397; *(3)* Wald., Tr. Z. S. 1872, VIII, 96; *(4)* Brügg., Abh. Ver. Bremen 1876, V, 95; *(5)* Rosenb., Malay. Archip. 1878, 278; *(6)* Meyer, Ibis 1879, 142; *(7)* Rosenb., Zool. Garten 1881, 167; *(8)* W. Blas., J. f. O. 1883, 130, 140.

c. **Erythra isabellina** *(1)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 679.

Amaurornis isabellina *(1)* W. Blas., Ztschr. ges. Orn. 1886, 158; *(2)* M. & Wg., Abh. Mus. Dresd. 1895, Mai, Nr. 8, p. 17.

d. **Oenolimnas isabellina** *(1)* Sharpe, Bull. B. O. C. 1893, V, p. XXVII; Ibis 1893, 260; *(2)* id., Cat. B. 1894, XXIII, 86; *(3)* Hart., Nov. Zool. 1897, 165.

"Taktak", near Manado, Nat. Coll.

Descriptions. Schlegel *b 1*; Sharpe *d 2*.

Adult male. Above bistre, washed with olive-grey on head, hind neck, mantle, back, scapulars, and wing-coverts, with cinnamon on the remiges; loral region like the crown; under parts rufous cinnamon, whitish on chin, upper throat, and malar region, darkest on sides, under wing-coverts and sides of neck, where it passes into the greyish olive of the hind neck; remiges below and some of the greater under wing-coverts more fawn-colour (♂ ad. Tomohon, 3. IV. 94: P.& F. Sarasin).

Female. In coloration similar to the male, apparently a trifle smaller; "bill yellow-green"; in the skin the legs and feet are much paler (♀, Tomohon, 10. III. 94: P.& F. Sarasin).

Young. A young example, probably not yet able to fly, is just like the adults in coloration, but without the grey hue on the brown of the upper surface; "iris sepia; legs brown; bill reddish brown"; wing (feathers half-grown) 118 mm; tail ca. 40; tarsus 63; mid. toe with claw 62; bill fr. feath. of foreh. 30.5 (Tomohon, 17. V. 94: P.& F. Sarasin).

Measurements.	Wing	Tail	Tarsus	Mid. toe and claw	Bill from forehead
a. (C 260) ad., Gorontalo 1875 (Riedel) . . .	165	66	62	62	34
b. (C 5264) ad., Manado (v. Mussch.)	161	66	62	64.5	—
c. (C 10946) ad., near Manado, Aug., Sept. 92 (N.C.)	165	63	67	69	36
d. (C 10484) ad., "Celebes" 1876	162	—	60	59	—
e. (C 10517) ad., "Celebes"	164	70	63	64.5	32.5
f. (Sar. Coll.) ♂ ad., Tomohon 14. IV. 94 . .	175	68	67.5	67.5	37.5
g. (Sar. Coll.) ♂ ad., Tomohon, 3. IV. 94 . . .	169	—	65.5	65	36.5
h. (Sar. Coll.) ♀ ad., Tomohon, 10. III. 94. . .	162	—	65.5	63.5	35

Distribution. North and West Celebes: — Minahassa (Meyer *b 6*, Bruijn *c 1*, etc.), Gorontalo Distr. (Forsten *b 1*, Rosenberg *b 1*, *b 4*, *b 7*, Riedel *1*), West Tawaya, Celebes (Doherty *d 3*).

The Isabelline Water-hen of Celebes is a very distinct species, easily distinguished from its nearest allies by the isabelline, or, more properly speaking, rufous cinnamon tint of its plumage, which is intensified into greyish olive-brown on the upper surface. Dr. R. B. Sharpe has created for it the peculiar genus *Oenolimnas*, but there is nothing to distinguish it structurally from *Amaurornis olivacea* of the Philippines, the type of the genus *Amaurornis*, with which genus Salvadori *(c 1)*, Brüggemann *(b 4)*, and Wilh. Blasius *(1)* have pointed out its affinities. *A. phoenicura* does not stand so high on its legs as *A. isabellina*, the tarsus being comparatively shorter; this is also the case, though not to a very appreciable extent, in *A. moluccana*. The white breast and face of the former, and the plumbeous colour of these parts in *A. moluccana* distinguish them at once from the present species, though their affinity with it is shown by the flanks and under tail-coverts, which are of a similar cinnamon tint in all three. Many Rails, however, which are structurally very different, correspond closely in coloration, so that, in arranging the system in this group, colour cannot be safely referred to as a guide to the nearest affinities.

Nothing is known of the habits of *A. isabellina*, which is a rather rare species in European collections and, hence, perhaps in its native island, from the North and West only of which it is known.

GENUS GALLINULA Briss.

In the Moor-hen the anterior toes are much longer than the tarsus, the hallux much longer than the first phalanx of the inner toe, the forehead is covered with a shield or flattened comb, and the bill is but little longer than the cranium and about four times as long as it is high across the nostril. The presence of the frontal shield serves to distinguish it from the other Rails occurring in Celebes except from *Porphyrio*, in which the stout bill is about twice as long as it is high, and *Fulica*, which has the toes lobated. Almost cosmopolitan.

307. GALLINULA FRONTATA Wall.

Red-legged Moor-hen.

Plate XLIII.

a. **Gallinula haematopus** [Temm. MS. in Leyden Mus.] *(1)* Schl., Mus. P.-B., Ralli, 1865, 44; *(2)* Rosenb., Malay. Archip. 1878, 278; *(3)* Dresser, B. Europe VII, 317 (1879); *(4)* Legge, B. Ceylon 1880, 782; *(5)* Rosenb., Zool. Garten 1881, 167; *(6)* Newton, Dict. B. 1894, 590.

Gallinula frontata *(1)* Wall., P. Z. S. 1863, 35, 487; *(2)* Wald., Tr. Z. S. 1872, VIII, 93; *(3)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 680; *(4)* Brügg., Abh. Ver. Bremen 1876, V, 90; *(5)* Meyer, Ibis 1879, 142; *(6)* Salvad., Orn. Pap. 1882, III, 279; Agg. 179 (1891); *(7)* W. Blas., J. f. O. 1883, 139; *(8)* id., ib. 1884, 215, 219; *(9)* Kutter, t. c. 225; *(10)* Guillem., P. Z. S. 1885, 560; *(11)* W. Blas,, Ztschr. ges.

Orn. 1886, 156; *(12)* Vorderm., N. T. Ned. Ind. 1886, XLVI, 239; *(13)* Heine & Rchnw., Nomencl. Mus. Hein. 1890, 318; *(14)* Büttik., Weber's Reise Ost-Ind. 1893, III, 282; *(15)* Sharpe, Cat. B. 1894, XXIII, 168; *(16)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 17; *(17)* Salvad., Ann. Mus. Civ. Gen. 1896, (2) XVI, 118; *(XVIII)* Meyer, Vogelskel. 1897, II, pl. CCXXXVI.

"Rembang ketjil" (= Small Rembang, *Porphyrio* being the Great Rembang), North Celebes, Meyer *5*.

"Rembang", Tondano, Nat. Coll.

"Weri" [Gorontalo], v. Rosenberg *a 3*.

For further synonymy and references cf. Salvadori *6*, Sharpe *15*.

Figure and descriptions. Meyer *XVIII* (skel.); Schlegel *a 1*; Wallace *1*; Brüggemann *4*; Salvadori *6*; Sharpe *15*.

Adult. Dark slate, of a bluer tinge above, becoming black on occiput and face; passing on lower back, rump, upper tail-coverts and inner remiges into dark greenish olive; other remiges brownish black; tail black; remiges below and greater under wing-coverts shining brownish slaty; feathers of abdomen slightly tipped with whitish; under tail-coverts buff-white, the middle ones black; a shield-plate covering forehead and crown "orange-red; bill darker red, yellow at tip; tarsus red, olive-green at the joints; iris reddish" — Guillem. *10* (♀ ad. Tomohon, 15. V. 94: P. & F. Sarasin).

Sex. The sexes are similar in coloration.

Immature. The frontal shield-plate very small; the olive of the upper surface extending on to the mantle; under surface much paler, viz. pale mouse-grey, some of the feathers on lower breast and sides tipped with whitish; bill in the skin yellow-greenish (Tondano neighbourhood, Aug.—Sept. 1892: Nat. Coll. — C 10960).

Measurements. In four adult ♀♀ the wings are 187, 198, 200, 201 mm; in eight other adults — sex not determined — 188, 189, 190, 190, 192, 195, 200, 206. It would, therefore, appear that Prof. W. Blasius is in error in holding the female for smaller than the male. Tail ca. 70; tarsus 57, mid. toe with claw 79; bill from lores ca. 29.

Eggs. "The eggs are very similar to those of *Gallinula chloropus*" (Nehrkorn MS.). Kutter suggested that the ground-colour is somewhat warmer, more brownish — perhaps an individual difference. 45 × 32.2 mm and 43.5 × 33 mm (S. E. Borneo — *9*).

Distribution. S. E. Borneo (Grabowsky *8*); Celebes — Minahassa (Meyer *5*, Fischer *4*, etc.), Gorontalo Distr. (Rosenb. *a 1*, *a 5*, Riedel *11*, etc.), Palima on Gulf of Boni (Weber *14*), Macassar (Wallace *15*); Buru (Wallace *1*, *15*); Amboina (Hoedt *a 1*, *6*); Flores (Wallace *1*); S. W. New Guinea (D'Albertis *6*, Goldie *15*).

This Moor-hen is easily distinguishable from *Gallinula chloropus*, which is also recorded from Celebes, by its wanting the broad streaks of white on the sides of the body, by its red legs, and larger size. It is more closely related to *G. tenebrosa* Gld. of Australia, which differs in having yellow and green legs, and in the paler colour of its under surface. From *Amaurornis*, which has often been united with it, *Gallinula* differs in possessing a frontal shield of horny substance, a weaker bill with the nostrils situated more anteriorly, longer toes, etc.

Next to nothing has been recorded of the habits of the Red-legged Moor-hen, which no doubt closely resemble those of the Common Moor-hen of Europe, though differences might probably occur to attentive observers. Grabowsky

found it breeding with *Porphyrio indicus* in Borneo, and nesting in a similar manner on 25th April. On the Lakes of Tondano and Limbotto in North Celebes this is a plentiful species; v. Rosenberg obtained young ones about a day old on August 19th, 1863, at Ayer-Pannas, Limbotto.

308. GALLINULA CHLOROPUS (L.).

Common Moor-hen.

a. **Fulica chloropus** *(1)* Linn., S. N. 1766, I, 258.

Gallinula chloropus *(1)* Lath., Ind. Orn. 1790, II, 773; *(II)* Naum., Vög. Deutschl. IX, 587, t. 240 (1838); *(III)* Gould, B. Gt. Brit. 1862, pl. 851; *(3bis)* Schl., Mus. P.-B., Ralli, 1865, 45; *(4)* Wald., Tr. Z. S. 1875, IX, 229; *(5)* David & Oust., Ois. Chine 1877, 485; *(6)* Tweedd., P. Z. S. 1877, 702, 767; *(7)* id., ib. 1878, 344, 953; *(8)* Hume & Davis., Str. F. 1878, VI, 466; *(IX)* Dresser, B. Europe VII, 313, pl. 503 (1879); *(10)* Legge, B. Ceylon 1880, 781; *(11)* Vorderman, N. T. Ned. Ind. 1882, XLII, 236; *(12)* Oates, B. Brit. Burmah 1883, II, 347; *(13)* Stejn., Pr. U. S. Nat. Mus. 1886, IX, 406; *(14)* Parker, Ibis 1886, 187; *(15)* Steere, List Coll. B. & M. Philipp. Is. 1890, 25; *(16)* Seeb., B. Japan Emp. 1890, 360; *(17)* Oates ed. Hume's Nests and Eggs 1890, III, 389; *(18)* Meyer & Helm, Verz. Vög. Sachs. 1892, 114; *(19)* Tacz., Faun. Orn. Sib. Orient. 1893, II, 1000; *(20)* Sharpe, Cat. B. 1894, XXIII, 169; *(21)* Oust., Nouv. Arch. du Mus. 1894, 82; *(22)* Bourns & Worces., B. & M. Menage Exped. Philipp. Is. 1894, 30; *(23)* Grant, Ibis 1894, 521; *(24)* Newton, Dict. B. 1894, 559.

b. **Gallinula orientalis** *(1)* Horsf., Tr. L. S. XIII, 195 (1821); *(2)* Rfl., t. c. 329 (1822); *(3)* Wald., Tr. Z. S. 1872, VIII, 94; *(4)* Salvad., Cat. Ucc. Borneo 1874, 342; *(5)* id., Ann. Mus. Civ. Gen. 1875, VII, 679; *(6)* W. Blas., J. f. O. 1884, 215, 218; *(7)* Kutter, t. c. 225; *(8)* Everett, J. Str. Br. R. A. S. 1889, 202; *(9)* Vorderm., N. T. Ned. Ind. 1890, XLIX, 416.

c. **Gallinula chloropus orientalis** *(1)* Hart., Nov. Zool. 1896, 164.

For further synonymy and references cf. Sharpe *20.*

Figures and descriptions. Naumann *II*; Gould *III*; Dresser *IX*; David & Oust. *5*; Legge *10*; Vorderman *11*; Oates *12*; Taczanowski *19*; Sharpe *20*, etc., etc.

Adult. Like *G. frontata* ad., but the sides of the body with white slashes, the legs and feet dull green (not red) with a red garter above the tibio-tarsal joint; frontal shield much smaller; size smaller; wing 155 mm; tail 67; tarsus 49; mid. toe and claw 70; bill from lores ca. 26; "bill red, tip yellow; feet yellow-green, claws grey" (♀, Luzon, 7. Feb. 1872: Meyer — Nr. 12155).

Sex. The sexes are alike in coloration, but Mr. Dresser affirms that the males on an average are smaller than the females, and a trifle duller in colour.

Immature. Above bistre, becoming hair-brown on head and hind neck; face whitish brown; chin and throat white; upper breast, sides and flanks drab-brown; lower breast and abdomen white; under tail-coverts buff-white, the middle ones black (♀ juv., Deutschbaselitz, Saxony: B. Geisler, Sept. 94 — Nr. 14372).

Chick. "Covered with hair-like blackish sooty down; bill and the frontal bare spot red; the sides of the head blue, and the chin and the upper throat with white points to the down; legs dark greyish, almost blackish grey; iris greyish brown" (Dresser *IX*).

Egg. Moderately smooth and glossy; pale pinkish buff, sparingly spotted and speckled with hazel brown, a few obscure marks of pinkish: ca. 44.5 × 31 mm (Moritzburg, Saxony,

June 1895: Schwarze). 6—9 or 10 in number (Dresser *IX*). Kutter described Grabowsky's specimens of the eggs from S. E. Borneo as similar to those of the *typical G. chloropus*, but, apparently, rather smaller on an average; size 38.6 × 29.2 to 48.3 × 32.1 mm; mean of 20 examples 42.5 × 30.4 mm *(b 6)*.

Nest. Hume *(17)* remarks that the "nest varies much in size and situation. Sometimes there is no nest at all, only a quantity of rush and rice bent down in situ to form a platform to support the eggs. Sometimes it is built up in the water like a Coot's. Often it is in some tuft or tussock of grass in a swamp, ditch or pond. Occasionally it is wedged up several inches above the water in some tamarisk or babool bush growing in a lake or jheel." In Europe, when built in rushes, the tops are often bent over the nest to form a screen; or a somewhat flat nest may be found several feet above the water in a bush. Dresser mentions a case of the bird building about 20 feet from the ground in a spruce fir.

Distribution. Europe up to about 63° N. in Scandinavia, W. Russia to about 60°, E. Russia to about 56°; Africa, Madagascar, Mascarene Islands, Mauritius, Bourbon (*G. pyrrhorhoa*); Asia, excep tthe North. India (Hume, etc. *17*); Ceylon (Legge *10*); Burmah (Oates *12*); Tenasserim (Davison *8*); China (David, Swinhoe, etc. *5*, *20*); S. E. Siberia (Dybowski and Godl. *19*); Japan (Blackiston, etc. *13*, *16*); Loochoo Is. (Perry *13*, *16*); Formosa (Swinhoe *5*, *20*); Philippines — Luzon, Cebu, Leyte, Guimaras, Panay, Mindoro, Mindanao (Cuming *3*, Meyer *4*, Everett *6*, *7*, Steere *15*, Bourns & Worcester *22*); S. and S. E. Borneo (Croockewit *3*, Grabowsky *b 6*, *b 8*); Sumatra (Raffles *b 2*, *20*); Java (Horsfield *b 1*, Vorderman *11*); Celebes — Macassar (Wallace *b 3*, Beccari *b 5*), Bulekomba near Macassar (Everett *c 1*), Manado (British Mus. *20*).

The Common Moor-hen has to be included in the Celebes list in virtue of two specimens from Macassar in the British Museum obtained by Wallace, two from the same locality collected by Beccari, 20th August, 1874, recorded by Salvadori, one recently obtained by Everett at Bulekomba *(c 1)*, and three further specimens in the British Museum. One of the last, a young bird without the collector's name, is indicated as having come from Manado, and is as yet the only proof of the occurrence of the species in the North of the island. On Lake Bangkau, S. E. Borneo, Grabowsky found it a plentiful species. In Java Vorderman, having obtained it in all seasons, considers it a resident species. In many countries the Moor-hen is known as a migrant, complete or partial; in other quarters, such as Gilgit and Heligoland, it is found only as a bird of passage. Styan holds it to be a summer visitant to the Lower Yangtse; possibly the birds do not proceed further south in winter than South China, where, according to Abbé David the species is resident. In the Philippines it is probably stationary, since it has been recorded by Walden and Steere from Luzon and Leyte in July, as well as from the first-named and other islands in winter, or less decidedly summer months. In South Celebes it will probably be found to be a resident bird, and from analogy with other species it is most likely that it reached this spot from Java or S. E. Borneo; the single specimen recorded from the Northern Peninsula may on the other hand have been rather a winter visitor from the north.

The Moor-hen in the Great Sunda Islands is smaller in size than the typical form of Europe and was named *orientalis* by Horsfield after Javan examples. Dr. Sharpe, working with the splendid series of about 200 specimens from all parts in the British Museum, could not, as might be expected, draw any hard and fast line between the eastern and western birds and unites them with the remark that "this small race is also prevalent in China". Examples from South and West Africa would also appear to be slightly different from European birds, a little smaller with a larger frontal shield (Dresser *IX*). Birds from Madagascar and Mauritius have the under tail-coverts more buff and differ also by their cry; these have been named *G. pyrrhorrhoa* by Prof. Newton. The American Moor-hen, *G. galeata* Licht., is also scarcely separable from that of the Old World; according to Sharpe it may be recognised by the very distinct white edge to its first primary and its truncated frontal shield. This bird again differs in size in North America, the West Indies, and some parts of South America.

For habits such standard works as Naumann *(II)*, Dresser *(IX)*, Legge *(10)*, and others may be referred to; or it may be watched on most of the ponds and rivers of Europe, where it is not displaced by the Coot.

GENUS PORPHYRIO Briss.

The Blue Coots are easily recognisable by their general plumage of blue and brown, and by their stout bills. The bill is somewhat longer than the cranium, in height about half its length, compressed, the nostril round with no appreciable nasal furrow; a large flat shield on the forehead and crown; legs large, middle toe much longer than the tarsus, hallux about $^2/_3$ the length of the lateral toes; wing moderate, 2nd, 3rd and 4th primaries the longest; tail about as long as the tarsus. Range: India to Australia, New Zealand and many islands of the Pacific; Africa, Madagascar, the Mediterranean countries.

309. PORPHYRIO CALVUS Vieill.

East-Indian Blue Coot.

Synonymy for South Celebes specimens:

a. **Porphyrio indicus** *(1)* Wald., Tr. Z. S. 1872, VIII, 92; *(2)* Tristr., Cat. Coll. B. 1889, 26.
b. **Porphyrio calvus** *(1)* Sharpe, Cat. B. 1894, XXIII, 200.
Diagnosis of adult. Differs from the typical form of Java in not showing so much green lustre on the back, and, apparently, in some other more dubious respects (ex Sharpe).
Distribution. South Celebes — Macassar (Wallace *a 2, b 1*).

Synonymy for North Celebes specimens:

c. **Porphyrio indicus** *(1)* Schl., Mus. P.-B., Ralli, 1865, 56; *(2)* Finsch & Hartl., Orn. Centralpolyn. 1867, 170 (Celebes); *(3)* Wald., Tr. Z. S. 1872, VIII, 92; *(4)* Rosenb., Malay. Archip. 1878, 279; *(5)* Meyer, Ibis 1879, 141; *(6)* W. Blas., J. f. O. 1883,

139; *(7)* Guillem., P. Z. S. 1885, 560; *(8)* id., Cruise "Marchesa" 1886, II, 208; *(9)* Platen, Gefied. Welt 1887, 206.

d. **Porphyrio indicus** var. **palliatus** *(1)* Brügg., Abh. Ver. Bremen 1876, V, 89.

e. **Porphyrio calvus** *(1)* Elliot, Str. F. 1878, VII, 16 (Celebes); *(2)* Salvad., Atti Ac. Sc. Torino XIV, 1879, 1169.

f. **Porphyrio melanoptera** *(1)* Rosenb., Zool. Garten 1881, 167; *(2)* Joest, Holontalo 1883, 105.

g. **Porphyrio calvus** var. **palliatus** *(1)* W. Blas., Z. ges. Orn. 1886, 154.

h. **Porphyrio smaragdinus** *(1)* Sharpe, Cat. B. 1894, XXIII, 203; *(2)* M. & Wg., Abh. Mus. Dresd. 1895, Mai, Nr. 8, p. 17.

"Rembang", Malay, N. Celebes, Meyer *c 5*. **"Panumbalang"**, Minahassa, Nat. Coll. **"Dentula"** [Gorontalo], v. Rosenberg *c 4*. **"Bontula"**, Gorontalo, Joest *f 2*.

Diagnosis of adult. Ordinarily larger than the Javan form, upper surface slightly darker; jugulum and upper breast cerulean blue, as against Nile-blue or pale greenish blue.

Distribution. North Celebes: — Minahassa (Forsten *c 1*, Meyer *c 5*, etc.), Gorontalo Distr. (Rosenberg *c 4*, *f 1*, Meyer *c 5*, etc.).

The species.

Figures and descriptions of *P. calvus*: Temminck, Pl. Col. V, pl. 421 (*P. smaragdinus*: Java); Peale, U. S. Expl. Exp. 1848, 221, pl. 62, fig. 2 (*P. vitiensis*: Fiji); Finsch & Hartlaub, Orn. Centralpol. 1867, 172, pl. XII, f. 3 (Fiji); Brüggemann *d 1* (N. Celebes); Elliot *e 1*; Vorderman, N. T. Ned. Ind. XLII, 113 (1882: Java); Sharpe *b 1*, *h 1*; etc.

Adult male. Above glossy clove-brown, face, chin, and occiput blackish, hind-neck and sides of neck dull blue, outer remiges washed with blue; fore-neck, upper breast, and carpal region bright China-blue; becoming duller blue on lower breast and sides, with a violet tint on sides of rump and thighs; abdomen sooty blackish; under tail-coverts pure white; remiges below shining dusky; under wing-coverts mostly China-blue; frontal plate covering crown and forehead "brilliant red, bill darker" — Guillem. *c 7*; "iris brown-red; feet flesh-red" (♂, Kema, 3. Aug. 93: P. & F. S.).

Female. Smaller than the male (Meyer *c 5*, and see measurements).

Immature. Differs from the adult in being lighter and greener above (one specimen in particular has broad margins of burnt umber to the feathers: Tondano — C 10963), the brilliant blue of the fore-neck and breast less developed; under-parts browner, washed with blue, with pale tips to the feathers on the lower breast; abdomen whitish; frontal shield much less developed (♀ juv., Limbotto, July, 1871: Meyer — C 2026; and others).

Measurements (adults! — we carefully exclude immature specimens).	Wing	Tarsus	Middle toe and claw	Bill from nostril
a. (C 10961) ad., Tondano, Aug.—Sept. 92 (Nat. Coll.).	250	91	106	28.5
b. (Sarasin Coll.) ♂ ad., Kema, 3. Aug. 93.	248	93.5	102.5	—
c. (C 2011) ad., Kakas, June, 71 (Meyer)	240	85.5	97	27
d. (C 2013) ad., Kakas, June, 71 (Meyer)	238	83	96	25
e. (C 2014) ad., Kakas, June, 71 (Meyer)	228	81	88	25
f. (C 2027) ♀ ad., Limbotto, July, 71 (Meyer) . . .	224	78	95	—
g. (C 2015) ♀ ad., Limbotto, July, 71 (Meyer) . . .	211	75	87	—
h. (C 2012) ♀ ad., Limbotto, July, 71 (Meyer) . . .	235	83	97	—
i. (C 3555) ad., Minahassa (Faber)	236	84	96	25
j. (Nr. 3899) ad., Minahassa (Faber)	231	81	98	29
k. (Nr. 6616) ad., Minahassa (v. Musschenbroek) . .	236	80	95	28
l. (Nr. 3900) ad., Java (v. Schierbrand)	215	78.5	93	24

Variation. The specimens from N. Celebes vary much in size and in the proportions of the different parts, in some the middle toe being, when compared with the tarsus, much longer than in others; and so for the other parts, each part varying in this bird, as in all other birds of which we have made or seen measurements, independently.

The frontal shield in the Minahassan birds varies much in adults, both in size and shape. In the young it is of course very small, but, taking only specimens which from the darker, more uniform colour of the upper parts and the absence of all traces of pale tips on the abdomen seem to be fully adult, the greatest width of the shield in specimen *d* (the narrowest) is 21.5 mm, in *b* (the broadest) 26 mm; but it is longer in the first specimen than in the second, viz. from nostril 39.5 as against 38 mm. As a rule Celebesian birds display a tolerably straight hind-margin to the shield, with fairly sharp, though rounded corners, but there are exceptions also to this (C 3555, less so C 2011, C 2027); and when it is known that this part varies with age (probably it is continually undergoing variation during the life-time of each individual), it seems obvious that its value as a criterion for species is nil.

As to colour, adult birds in North Celebes vary very little among themselves, both as regards the glossy clove-brown of the upper surface and the blue of the breast and other under-parts, and we find that these hues suffer little from keeping, specimens killed by Meyer in 1871 agreeing perfectly well with the freshest skins before us. Herein, therefore, we are inclined to be at variance with Dr. Sharpe, when he remarks that he believes that the greenish gloss of *P. ellioti* of the Admiralty Islands is due only to the fresh condition of the plumage. But there is a "thin" look about the feathers of the upper surface of many of the old skins from N. Celebes, as if their pigment had dried up and faded, and the feathers display close, narrow cross-bars, more or less distinct; it is more difficult to find these traces in the fresh skins in hand, but we suspect that they will be more apparent in the living bird when in worn plumage after the breeding season, though most probably this character varies. Immature birds from N. Celebes display a greener or lighter brown on the upper surface, due to the feathers being broadly fringed with burnt umber or bronze-green; one of our specimens has a more glaucous blue tint on the breast like Javan adults. Dr. Sharpe remarks that it is probable that the Javan bird ranges to N. Celebes, specimens examined by him from Gorontalo being *calvus*, while those from Ayer Pannas (this is a place on Lake Limbotto whence the "Gorontalo" specimens also came) and Tondano are *P. smaragdinus*. It may well be that N. Celebes has been colonised from the south-west (Java and S. Celebes) and also from the east, that the present is a mixed race, the result of interbreeding, and that the birds resembling those of Java, like the immature specimen just mentioned, are not adult or are individual varieties in which "ancestral influences" have taken strong effect; but it may also be that the gradual transitions from the Javan form to those of Australia and New Zealand arose, as the bird spread its range from west to east and south, from as yet unknown causes which became stronger as the geographical separation from Java grew wider (see *Haliastur indus*).

Eggs. Three to five; spotted with black and red (N. Celebes, Meyer *c 5*). Gallinuline in type; long oval, with rounded tip; dirty clay-yellow, with smaller and larger spots of liver-brown and paler shell-spots, somewhat conglomerated about the large end, the remaining surface almost clear: from 47.6 × 32.2 to 45.5 × 32.0 mm (S. E. Borneo — Grabowsky: Kutter, J. f. O. 1884, 225).

Nest. Of heaps of rice-plant, brought together and trampled down (N. Celebes, Meyer *c 5*). Of damp, rotting grass, scarcely above the surface of the water: April 25th, 1882 (S. E. Borneo — Grabowsky l. c.).

Distribution. From Java and S. E. Borneo to Australia, Fiji, Samoa and New Zealand, varying locally in almost every spot.

The type of *Porphyrio calvus* was described from Java by Vieillot in 1819 (N. Dict. d'Hist. Nat. XXVIII, 28). A year later it received the name *P. indicus* from Horsfield, and Vieillot's name was overlooked, until Mr. Elliot *(e 1)* reinstated it in 1878. Next Temminck in 1826, intimating that he had no intention of abandoning his MS name in the Leyden Museum for that of Horsfield, published the name *smaragdinus* for the same bird. Schlegel *(c 1)* indicates two examples in the Leyden Museum from Java as Temminck's types.

The Blue Coot seems to vary racially in almost every island of the East Indies and Australasia, but it also varies very much individually, and with age and sex, upon which some light is thrown by the good series from N. Celebes in the Dresden Museum. With a hundred specimens from a hundred different localities it might be possible to define a hundred different "species"; but, were each locality represented by a score of adult birds, we do not believe that any race could be clearly marked off from its next neighbours. Local races exist, but individual variation is so great that it obliterates the characters which are bound to the locality.

In Java the bird is generally noteworthy for the greenish tint of the light blue of its jugulum; in the Siamese and Malayan Peninsula it has a greyish throat and face (*P. edwardsi* Elliot); in S. E. Borneo a young specimen examined by Prof. W. Blasius was of very small size; in South Celebes the bird, according to Sharpe, is less green than in Java; in North Celebes it is also less green, purer blue on the jugulum, and larger; in Ceram, as Schlegel says *(c 1)*, it is darker and less green-brown above (*P. melanoptera* Temm.), and Count Salvadori (Orn. Pap. III, 252) adds that it is larger here in size, with a different shield (a most untrustworthy character), and without the malachite tint on the jugulum, etc.; New Guinean birds are united with the Moluccan ones by Count Salvadori; they are rather dark, but, judging from two before us, cannot be distinguished from many from North Celebes; in the Admiralty Islands the bird is said to be greener again above like the Javan form, but bigger and with a different shield (*P. ellioti* Salvad.); in New Britain it is greener above than in Java and smaller than in the Admiralty Islands (*P. neobrittanicus* Meyer); the Pelew Islands harbour a very similar form with more blue on the primaries, and the breast and under-parts apparently more uniform (*P. pelewensis* H. & F.); the birds inhabiting the Fiji Islands were held by Drs. Finsch and Hartlaub to be more olive above than *calvus* and less brilliant blue on the neck and breast (*P. vitiensis* Peale); in Samoa the bird tends to still lighter olive (*P. samoensis* Peale); from Aneiteum in the New Hebrides Canon Tristram has described a larger bird as half-way between *P. calvus* and *melanonotus* of Australia and New Zealand *(P. aneiteumensis);* Vate in the New Hebrides has

furnished "a singularly small delicately formed specimen" (Layard, Ibis 1880, 292); very large birds occur in New Caledonia; the largest race with the darkest upper suface is found in Australia (except the West) and New Zealand (*Porphyrio melanonotus*); another large bird with azure-blue on the throat comes from West Australia (*P. bellus* Gould); and so on.

These differences have led ornithologists, who have gone into the question from different collections, to arrive at their own conclusions and to express different opinions, and, it may be, to harbour thoughts about their predecessors' work which were advisedly left unspoken. Some of the chief work on the genus has been done by Schlegel, Mus. P.-B., Ralli, 1865, 55—58; Elliot, Str. F. 1878, VII, 6—25; Salvadori, Atti Ac. Sc. Torino 1879, XIV, 1165—1170; Meyer, Abh. Mus. Dresd. 1891, No. 4, p. 15, 16; Sharpe, Cat. B. 1894, XXIII, 200—206[1]).

For the present it might be wisest to speak of all the races from Java to New Zealand as *Porphyrio calvus*, and when the amount of individual, sexual and seasonal variation, and changes due to age are known, then the local races may be defined and studied.

The Blue Coot is plentiful in North Celebes. Meyer observes *(c 5)* that the birds swim well and run rather than fly. The males fight much together and are very noisy. They feed on fishes, but also damage the rice-fields very much; they eat the tip of the young plant before it has flowered. Their cry is tet, tet, tet, very sharp and loud. No specimens except those of Mr. Wallace are on record from South Celebes, where it may be rarer. In Fiji Layard *(e 1)* found that it fed on fish, crabs, insects, sugar-cane, and berries, to get which it perches on trees. A pair in captivity pecked out the brains of some young Parrots, and a similar observation has been made by Canon Tristram on an allied Blue Coot, which treated a young duckling in this manner. In feeding the Australian bird was observed by Dr. Bennett always to take its food in its foot, so eating it like a Parrot.

310. PORPHYRIO PULVERULENTUS Temm.

Philippine Blue Coot.

Porphyrio pulverulentus *(I)* Temm., Pl. Col. V, pl. 405 (1826); *(II)* Rchb., Hb. Fulicariae t. CVIII, figs. 1098—99 (1852); *(3)* Wald., Tr. Z. S. 1872, VIII, 92; *(4)* id., ib. 1875, IX, 228; *(5)* Steere, List Coll. B. & M. Philipp. Is. 1890, 25; *(6)* Sharpe, Cat. B. 1894, XXIII, 207; *(7)* Bourns & Worc., B. Menage Exp. 1894, 30.

[1]) As latest authority Dr. Sharpe will probably be followed until yet another system is advanced; we do not, therefore, hesitate to say that in our opinion Dr. Sharpe's treatment of *Porphyrio* is, for him, surprisingly disappointing. Two specimens from Viti Levu are placed under *P. ellioti*, two others from the same island under another species; the specimens from New Britain are placed under one species *smaragdinus*, Meyer's name thereto, *neobrittanicus*, is made a synonym of another, *ellioti;* a bird from the N.W. end of New Guinea, Dorey, is identified with Australian ones, though shown to differ; specimens from S.E. New Guinea are made a different bird; an assortment of specimens from all sorts of localities constitutes species Nr. 10; and Temminck's name, *smaragdinus*, is removed from the Javan bird and conferred upon this!

a. **Porphyrio poliocephalus** (nec Lath.) Schl., Mus. P.-B., Ralli, 1865, 54.
"**Tamaroro**", Karkellang, Nat. Coll.
For further references cf. Sharpe *6*.
Figures and descriptions. Temminck *I*; Reichenbach *II*; Sharpe *6*.
Adult. Back, scapulars, adjacent inner wing-coverts and inner remiges, rump, and upper tail-coverts burnt umber-brown; tail darker, washed with blue; rest of wings, upper mantle, neck, head, and under parts blue, — palest, or glaucous blue, on face, chin, and throat; darker on head, mantle, wing-coverts, and breast; still darker and more indigo on flanks and thighs, pale and more verditer on remiges; under tail-coverts white; remiges below and longest under wing-coverts shining blackish, the rest blue; legs, feet, bill, and plate on forehead and crown red (ad. Karkellang Id., Talaut, autumn, 1896 — C 15427).
Measurements. Wing 235 mm; tail 100; tarsus 88; middle toe with claw 102; bill from nostril 28.5.
Distribution. Philippine Islands — Luzon (Cuming *6*, Steere *5*), Mindoro (Bourns & Worcester *7*); Talaut Islands — Karkellang (Nat. Coll. in Dresden Mus.).

A single specimen of this bird was obtained in Karkellang by our hunters in the autumn of 1896. It is easily distinguishable from *P. calvus* by its glaucous blue face and throat, and by its blue wings. It seems to be a rare bird in European collections.

GENUS FULICA L.

The Coots are very like the Moor-hens, *Gallinula*, in general appearance, but are easily recognisable by the toes, which are lobed for swimming. The tail is also shorter, being about equal to the tarsus, and the bill, at least in the European species which has been recorded from Celebes, is relatively shorter and stouter. The Coots are of strictly aquatic habits, rarely venturing on land. Almost cosmopolitan.

311. FULICA ATRA L.

Coot.

Fulica atra *(1)* Linn., S. N. 1766, I, 257; *(2)* Horsf., Tr. L. S. 1821, XIII, 197; *(III)* Naum., Vög. Deutschl. IX, t. 241 (1838); *(IV)* Gould, B. Gr. Brit. 1862, IV, pl. 84; *(5)* Schl., Mus. P.-B., Ralli, 1865, 60; *(6)* Hume, Str. F. 1873, I, 249; *(7)* Butler, Str. F. 1876, IV, 20; *(8)* Scully, t. c. 191; *(9)* David & Oust., Ois. Chine 1877, 489; *(10)* Hume & Davis., Str. F. 1878, VI, 465; *(XI)* Dresser, B. Eur. VII, 327, pl. 504 (1879); *(12)* C. Swinh., Ibis 1882, 122; *(13)* Oates, B. Br. Burmah 1883, II, 352; *(14)* Stejn., Pr. U. S. Nat. Mus. 1886, IX, 408; *(XV)* Meyer, Vogelskel. 1889, II, pl. CXXX; *(16)* Oates ed. Hume's N. & Eggs 1890, III, 386; *(17)* Seebohm, B. Japan. Emp. 1890, 360; *(18)* W. Evans, Ibis 1891, 79; *(19)* Styan, t. c. 329, 501; *(20)* Lydekker, t. c. 393; *(21)* Hartl., Abh. Ver. Bremen 1892, XII, 332; *(22)* De La Touche, Ibis 1892, 495; *(23)* Meyer & Helm, Verz. Vög. Sachsens 1892, 114; *(24)* Meade-Waldo, Ibis 1893, 202; *(25)* Newton, Dict. B. pt. I, 1893, 102; *(26)* Tacz., Faune Orn. Sib. Orient. 1893, II, 1001; *(27)* Sharpe, Cat. B. 1894, XXIII, 210; *(28)* Helm, Orn. Monatsschr. 1895, 8.

a. **Fulica lugubris** *(1)* S. Müll., Verh. Natuurk. Comm. 1839—44, 454; *(2)* W. Blas., J. f. O. 1883, 140; *(3)* Vorderm., N. T. Ned. Ind. 1886, XLVI, 239; *(4)* id., ib. 1890, XLIX, 416.

b. **Fulica atra japonica** *(1)* Temm. & Schl., Faun. Jap. Av. 1850, 120, pl. LXXVII.

c. **Gallinula lugubris** *(1)* Rosenb., Zool. Garten 1881, 167; ?*(2)* Platen, Gef. Welt 1887, 206.

For full synonymy and references cf. Sharpe *27*, Taczanowski *26*.

Figures and descriptions. Naumann *III*; Gould *IV*; Dresser *XI*; Meyer *XV* (skeleton); Schlegel *5*; David & Oustalet *9*; Oates *13*; Sharpe *27*; etc., etc.

Adult. Dark slaty, blackish on head, face, neck, and under tail-coverts, palest on under-parts; secondaries whitish at tip; frontal shield nearly white; toes with side-flaps; "legs bluish grey, the bare part of the tibia orange; iris deep red" (Dresser); wing 205 mm; tail ca. 60; tarsus 56; middle toe with claw 83; bill from lores 30 (ad., Saxony — Nr. 14162).

Female. "Resembles the male, but is smaller, and the colours of the plumage are less pure in tint" (Dresser *XI*).

Young. "Much browner than the adult, the feathers of the head dusky blackish edged with white; lores, eyebrows and sides of face white; under surface of body ashy whitish, browner on the flanks" (Sharpe *27*).

Chick. "Covered with close hair-like slaty black down tipped with white; frontal membrane red; bill red at the base, and white towards the tip; legs dull lead-grey; iris brownish yellow" (Dresser *XI*).

Egg. Pink-buff, minutely speckled and sparsely spotted with brownish black, pale spots faintly intermingled: 54.5 × 35 mm ca. (Saxony, Dresd. Mus.).

Nest. Large, of rushes and the like built up in the water among reeds, etc. (see, also, Hume *16*, Dresser *XI*, etc.).

Distribution. Europe; N. Africa; Asia: India — all suitable parts (Hume etc. *16*); Burmah (Oates *13*); Tenasserim (Davison *10*); S. E. Siberia (Pallas, Dybowski etc. *26*); Manchuria (David *9*); China (David *9*, Swinh. *27*, etc.); Japan (Blakiston *17*); Loochoo Is. (Pryer *17*). Philippines — Luzon (Maitl.-Heriot *27*); North Celebes — Gorontalo Distr. (v. Rosenberg *c 1*); ?Borneo (Vorderm. *a 3*); Sumatra (Vorderm. *a 4*); Java (S. Müller *a 1, 5*).

Rosenberg *(c 1)* puts down eleven examples of *Gallinula lugubris* as having been obtained by him on Lake Limbotto. This name is also a synonym of *Gallicrex cinerea* (Gm. — fide Sharpe), a species ranging from India to Java, Borneo and the Philippines, but the *G. lugubris* of v. Rosenberg would appear to be the Common Coot, since Professor W. Blasius was able to confirm its occurrence in Celebes from an example in the second "Schneider" collection examined by him, said to be of certain Celebes origin. This may have been one of v. Rosenberg's examples; Prof. Cabanis' specimen with the notched stiffening-stick in the Berlin Museum, mentioned by Blasius, may better have come from Meyer, who taught the natives there this method of indicating the ♂ sex. Further confirmation of the occurrence of this bird in Celebes is desirable.

The Coot is most likely a migrant to Celebes. Such it is in North and Central Europe, where the large reed-ponds it frequents get frozen over in winter. At this time it makes its appearance in South Europe in greatly

increased numbers, passing as far south as the Canary Islands, or still further. Prjevalsky and Radde *(26)* likewise found it to be a summer visitant to N. E. Asia (Lake Khanka, the Tareï-nor); it is resident in Central China, viz. the Lower Yangtse, but its numbers are greatly increased here in winter (Styan *19*), while Mr. De La Touche records it *(22)* from South China, — Foochow and Swatow — only in winter. Very possibly this southern migration in winter is carried as far south as North Celebes. In Turkestan Scully found it to be a summer migrant; at Kandahar C. Swinhoe found it in enormous numbers in February, but it stayed only about a month; through Gilgit, as Biddulph and Scully found, it seems to pass only in migration, but in India, though very many descend no doubt from northern latitudes in winter, it is present all the year and breeds throughout the country, according to Hume, "in large jheels and lakes that contain water all the year round". It is not recorded from Ceylon by Legge, nor from Borneo by Everett, though Vorderman has it in his list of Bornean birds.

The Coot is a true water-bird, only venturing on land as something out of the way, when, as Helm *(28)* pretty clearly shows, it does not seem to feel at ease. Its life in the water and on the mud at the banks may probably be looked to as the cause of the development of the side-flaps of the skin on the toes. Its affinities with the Moor-hen, which may always be found on land as well as water, are obvious; the latter, however, has simple toes.

As a species the Common Coot is most nearly allied to *F. cristata* Gm. of Africa in which the hinder rim of the frontal shield is raised into knobs, and *F. australis* Gld., of Australia, which is identified with *F. atra* by Schlegel, Dresser and Seebohm, but ranked as distinct by Sharpe — the white on the tips of the outer secondaries being almost absent, and the size small. East Siberian birds are said by Taczanowski to have the frontal shield with a compressed rim behind. Salomon Müller's two specimens from Java in the Leyden Museum are of small size.

ORDER LIMICOLAE.

The Jacanas, Plovers, Sheathbills, Coursers, Sandpipers, Curlews. They differ from the Rails by their pointed wings and light, active flight, by their unconcealed habits and the open character of their haunts — usually the sea-shore, the strand of rivers, mud-flats, plains, swamps, — by their incapacity for swimming (except *Phalaropus* and to an indifferent extent some of the Waders); they feed chiefly upon worms, grubs and insects (except *Thinocorus* and *Attagis* which look like *Turnices*), and lay a small number of eggs in a scanty nest

or in none. The tarsus is naked, often long; the hallux generally absent in the Plovers — very small when present, small in the Sandpipers and Coursers, well developed and with a very long claw in the Jacanas. They are said to have 11 primaries, but the first one is concealed and exceedingly minute, if indeed it is present in all species; the fifth secondary is wanting; tail-feathers 10 to 26, usually 12.

The palate is schizognathous, with a pointed vomer; furcula U-shaped, almost always with a small hypocleidium; two carotid arteries; sternum usually either with two pairs of processes, or two fenestrae, in its posterior margin, sometimes only one pair of processes.

Most of these birds are great migrants, breeding in the North and wintering in southern climates.

FAMILY PARRIDAE.

Dr. Gadow remarks (Bronn's Kl. u. Ordn. VI, Abth. 4, Vög. 1893, II, 205): "The differences from the Rails are sufficiently large; especially the general structure of the sternum, the flexor tendons of the toes, notwithstanding a similar form of foot, shizorhinal nasal processes, basipterygoid processes. On the other hand the intestinal convolutions are very like those of the Rails".

The long toes, especially the long hallux furnished with an enormous, slightly recurved claw, easily distinguish them from the other *Limicolae*.

GENUS HYDRALECTOR Wagl.

The size of a Turtle-dove, easily recognised by its greatly lengthened claws which are adapted to enable the bird to walk over aquatic plants. The hind toe with the claw is longer than the anterior ones, the claw being about four times the length of the hallux. The tarsus is large, but shorter than the toes, naked and transversely scutellated, as is also the lower half of the tibia. On the basal half of the maxilla a perpendicular comb, with a transverse flap in front of the forehead; wings moderate; rectrices 10, shorter than the tarsus. Nest floating, or near the water's edge; eggs curiously scrawled over with black flourishes, etc. A single species.

312. HYDRALECTOR GALLINACEUS (Temm.).

East-Indian Jacana.

a. **Parra gallinacea** *(1)* Temm., Pl. Col. Nr. 464 (1828); *(2)* Brügg., Abh. Ver. Bremen 1876, V, 90; *(3)* Rosenb., Malay. Archip. 1878, 279; *(4)* Nehrk., J. f. O. 1879, 409; *(5)* Rosenb., Zool. Garten 1881, 167; *(6)* Joest, Holontalo 1883, 106.

Hydralector gallinaceus *(1)* Wagl., Isis 1832, 280; *(2)* Wald., Tr. Z. S. 1872, VIII, 92; *(3)* Meyer, Ibis 1879, 141; *(4)* Salvad., Orn. Pap. 1882, III, 308; *(5)* W. Blas.,

J. f. O. 1883, 139; *(6)* id., ib. 1884, 216, 219, 221; *(7)* Kutter, t. c. 226; *(8)* Guillem., P. Z. S. 1885, 560; *(9)* Meyer, Z. ges. Orn. 1886, 38; *(10)* W. Blas., t. c. 152; *(11)* Guillem., Cruise "Marchesa" 1886, II, 208; *(12)* Everett, J. Str. Br. R. A. S. 1889, 204; *(13)* Salvad., Agg. Orn. Pap. 1891, 201; *(14)* Newton, Dict. B. 1893, 464; *(15)* Sharpe, Cat. B. 1896, XXIV, 79, 728.

b. **Hydralector cristatus** *(1)* Bp. (nec Vieill.), Compt. Rend. 1856, XLIII, 598, Nr. 295.

c. **Parra cristata** *(1)* Schl. (nec V.), Mus. P.-B., Ralli, 1865, 68; *(II)* id., Dierent. 1872 fig. p. 265; *(3)* Heine & Rchw., Nomencl. Mus. Hein. 1890, 316.

d. **Parra novae guineae** *(1)* Ramsay, Pr. L. Soc. N. S. W. 1878, II, 298.

e. **?Hydralector novae hollandiae** *(1)* Salvad., Orn. Pap. 1882, III, 309.

"**Pihndo**" (Rosenb. *a 3*) or "**Pientu**" (Joest *a 6*), Gorontalo Distr.

For synonymy and further references cf. Salvad. *4*; Sharpe *15*.

Figures and description. Temminck *a I*; Schlegel *c 1*, *c II*; Salvadori *4*; — the supposed Australian race, *H. novae hollandiae* Salvad., is figured by Gould, B. Australia VI, pl. 75, as *Parra gallinacea*; Sharpe *15*.

Adult. Forehead, sides of face and of neck, and jugulum light silky orange-buff, passing into white on chin and throat; a black stripe from the corner of the eye to the base of lower mandible; head above, hind neck, mantle, sides, under wing-coverts and entire breast black with a steel-blue gloss on head, neck and mantle; upper parts deep glossy broccoli-brown passing into bluish black on rump, tail, lesser wing- and primary-coverts and remiges (except the inner ones); abdomen white, with a strong tinge of orange-buff on the flanks and under tail-coverts; carpal edge furnished with a spur (bony knob); culmen with a thin vertical comb, based behind opon a longer horizontal flap "reddish yellow; iris yellowish brown; bill black at tip, dirty yellowish at base; feet and tarsus olive-slate" — Guillem. *8*; claws slightly recurved, the hind one exceedingly long; wing 123 mm; tail 38; tarsus 57; middle toe 54, claw thereof 22; hind toe 17, claw thereof 69; bill from gape 26 ("♀" [?♂] Lake Limbotto, July, 1871: Meyer — C 1994).

Female. Much larger than the male. The wing-length seems to vary in males from 118 to 132 mm, in females from 135 to 144 mm; and in cases where the wing-length lies between 130—140 mm, the length of the tarsus affords a sure test; namely, the tarsus in females appears to be 6 cm or more, in the male at least some millimeters and usually a whole centimeter less than 6 cm (W. Blasius *10*).

Young. The young of the Australian bird is described by Gould as differing by having the whole under surface white, crown of the head and occiput reddish chestnut, the line down the back of the neck brown, and the back reddish brown, each feather margined with a still redder hue; only an indication of the helmet; iris light brown and the bill aurora-red with the exception of the base of the lower mandible, which is light yellowish white (Handb. B. Austr. II, 333).

Eggs. 4 in number *(7)*. "The eggs certainly belong to the most interesting ones there are. They resemble in general the other *Parra*-eggs, have a clay-yellow ground with numerous deep black worm-lines and flourishes (Wurmlinien und Schnörkel), are very glossy, and measure 30 × 22 mm" (Nehrkorn MS.). The egg from Australia is figured by E. P. Ramsay, Ibis 1867, 417, pl. VIII, fig. 3, and by North, Nests and Eggs B. Austr. 1889, 327, pl. XVI, fig. 8.

Nest. In Borneo the eggs were found by Grabowsky *(6)* resting, without any nest, free on the small fleshy leaves of a swimming water-plant. In Australia, "composed of sedges, grass, and aquatic plants, is placed close to the water's edge, or upon any bunches of weeds or grass growing in the water" (Ramsay).

Distribution. Borneo — Lake Bangkau (Grabowsky *6*, *10*); Celebes — Lake Limbotto (Forsten *c 1*, Rosenberg *c 1*, *a 3*, etc.); Macassar (fide Walden *2*, Wallace *15*); ?Amboina, ?Banda, Mysol, New Guinea (Salvad. *4*, *13*). [Australia — Queensland and New South Wales — Gould, Ramsay.]

Want of material from Australia prevents us from uttering any opinion on the racial distinctness of the Australian bird, called *H. novaehollandiae* by Count Salvadori on account of its larger size and paler upper surface; but Prof. W. Blasius *(10)* has shown that females usually much exceed the measurements given by Salvadori for East-Indian birds.

This remarkable species is very local in its distribution: for instance it is as yet known only from Lake Bangkau in Borneo, and only (with certainty) from Lake Limbotto in North Celebes and from Macassar (? near) in the South. On Lake Limbotto it occurs in flocks, Here Rosenberg obtained its eggs, and remarked how its lengthened claws enable it to run about with facility on the floating leaves of "*Nelumbium speciosum*". A good account of its habits is given by Gilbert in Gould's works. It swims and dives well, but its flight is weak; it feeds on aquatic insects and some kind of vegetable matter. All naturalists write with pleasure of its handsome and striking appearance in its native haunts.

The genus *Hydralector* is represented by the present species only. In its wonderfully lengthened hind claw it surpasses all the other Jacanas, which, like it, have feet especially adapted for running over floating water-plants. The comb is another peculiarity of the East-Indian form. Its nearest affinities seem to be with the Water Pheasant, *Hydrophasianus*, of India, Ceylon and China to the Philippines and Borneo, and with the Jacana of South America, and systematically they appear to come between the Rails and the Plovers. As Prof. Newton says *(14)*, the Jacanas "have most frequently been classed with the *Rallidae*, but are now admitted to form a separate family, *Parridae*, whose leaning is toward the *Limicolae*, as apparently first suggested by Blyth, a view supported by the osteological observations of Parker (Proc. Zool. Soc. 1853, 513), though denied by Prof. A. Milne-Edwards (Ois. Foss. France II, p. 110)."

Metopidius indicus (Lath.)

In the geographical distribution of this species Dr. Sharpe indicates Celebes (Cat. B. 1896, XXIV, 72). His authority seems to be Schlegel (Mus. P.-B., Ralli, 1865, 68), who, however, simply catalogues a "très jeune individu, indiqué par Mr. Temminck, mais probablement par erreur, comme ayant été recueilli par Mr. Forsten à Gorontalo dans l'île de Célèbes". There is therefore at present insufficient evidence of the occurrence in Celebes of this species, which may be distinguished from *Hydralector gallinaceus* by its blackish green remiges and by its not having an erect comb on the frontal lappet.

FAMILY GLAREOLIDAE.

The bill is somewhat decurved, resembling that of the *Gallinae* and Sand-grouse in external appearance. According to Dr. Gadow the separating wall of the nostrils is complete, in old examples for the most part ossified, that is, with *nares imperviae*, as in *Thinocorus*, *Pterocles*, *Columbae*, in contradistinction to the remaining *Charadriiformes*. The nasal pits are very large, but for the most part surrounded by soft connecting tissue, so that the nostrils are externally confined to the anterior end; the orifices are roundish, not slit-shaped.

GENUS GLAREOLA Briss.

Wings exceedingly long, first primary abortive and concealed, the next much the longest and very pointed; tail of 12 feathers, longer than the tarsus, slightly rounded to forked in shape; tarsus longer than the middle toe and claw, transversely scaled. The general colour is sandy brown, which probably harmonises with the sandy wastes to which the birds seem to be partial.

313. GLAREOLA ISABELLA Vieill.

Long-legged Pratincole.

Glareola isabella *(1)* Vieill., Analyse 1816, 69; *(II)* id., Gal. Ois. II, 159, pl. 263 (1825); *(3)* Salvad., Cat. Ucc. Borneo 1874, 320; *(4)* Meyer, Verh. z.-b. Ges. Wien 1881, 769; *(5)* Vorderm., N. T. Ned. Ind. 1886, XLVI, 237; *(6)* id., ib. 1890, XLIX, 415; *(7)* id., ib. 1891, L, 515; *(8)* id., Notes Leyden Mus. 1891, XIII, 129; *(9)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 15; *(10)* iid., ib. 1896, Nr. 2, p. 20.

a. **Glareola grallaria** *(1)* Temm., Man. d'Orn. II, 1820, 503; *(II)* Gould, B. Austr. 1848, VI, pl. 22; *(3)* id., Handb. B. Austr. 1865, II, 243; *(4)* Schl., Mus. P.-B., Cursores, 1865, 18; *(5)* Wald., Tr. Z. S. 1872, VIII, 117; *(6)* Meyer, J. f. O. 1873, 405; *(7)* Rosenb., Malay. Archip. 1878, 278; *(8)* E. P. Ramsay, Pr. L. Soc. N. S. W. 1883, VII, 410; *(9)* Bennett, ib. 1886, X, 168; *(10)* Rams., ib. 1887, (2) II, 171; *(11)* Seeb., Distr. Charadr. 1887, 263; *(12)* Rams., Tab. List 1888, 20; *(13)* Everett, J. Str. Br. R. A. S. 1889, 204; *(XIV)* North, Nests & Eggs B. Austr. 1889, 308, pl. XVI, f. 9 (egg); *(15)* Büttik., Notes Leyden Mus. 1892, XIV, 206; *(16)* id., Zool. Erg. Weber's Reise 1893, III, 282; *(17)* Newton, Dict. B. 1894, 741.

b. **Glareola australis** *(I)* Leach, Tr. Z. S. XIII, 1820, 132, pl. 14, figs. 1, 2.

c. **Australasian Pratincole** *(1)* Lath., Gen. Hist. 1826, IX, 366.

d. **Stiltia grallaria** *(1)* Bp., Compt. Rend. 1856, XLIII, 419, Nr. 113.

e. **Stiltia isabella** *(1)* Salvad., Ann. Mus. Civ. Gen. XVIII, 1882, 322; *(2)* id., Orn. Pap. 1882, III, 286; Agg. 1891, 198; *(3)* Madar., Aquila 1894, 105; *(4)* Sharpe, Cat. B. 1896, XXIV, 51, 725.

"Paras", Minahassa, Nat. Coll.

"Alalang", Peling Id., Nat. Coll.

For further references cf. Salvadori *e 2*; Sharpe *e 4*.

Figures and descriptions. Gould *a II*, *a 3*; Vieill. *II*; North *a XIV* (egg); Salvadori *e 2*; Seebohm *a 11* (diagn.); Vorderman *7*; Sharpe *e 4*.

Adult. Head, back and breast isabelline, browner on head and inner remiges, paler on breast, sides of neck and face, nearly white on chin and throat, the feathers of the upper parts edged with rufous cinnamon; lores dusky; outer primaries and primary-coverts black, the first quill with the shaft white, metacarpal edge brown and white; secondaries, and inner webs of the inner primaries, pale drab-brown; lower back and rump dark drab-brown; upper tail-coverts and basal part of rectrices white; terminal half of tail-feathers black, tip white, stained with the black, outermost rectrices almost entirely white; lower sides and abdomen deep maroon; hind flanks and under tail-coverts white; under wing-coverts and axillaries black; remiges below dusky; "iris Vandyke-brown; terminal part of bill black, base dark red; feet dark brown, nearly black" — Vorderman 7 (ad., near Tondano, Aug.—Sept., 1892: Nat. Coll. — C 10831).

Sex. Sexual differences of coloration have not yet been shown to exist. Two specimens in the Dresden Museum, which, from their great length of wing, must be fully adult, have not the bill abruptedly divided into a black tip and red base; and a line of brown spots along the submalar region and across the jugulum, forming a horse-shoe, surrounds the whitish throat; these are perhaps adult females (Tondano — C 10838, Manado — C 10938). A specimen marked ♀ in the Sarasin Collection (Macassar) is not so characterized.

Young of the year. Like the adult, but rather browner above, breast paler and with dark centre-spots to the feathers, abdomen paler chestnut; bill black, hardly redder at the base; outer remiges less elongated (near Tondano — C 10836).

Chick. Covered with down, closely resembling the earth on which it is hatched (Bennett *a 9*).

Measurements (8 adults). Wing 190—213 mm; tail 56—65; tarsus 45—50; bill from nostril 10.

Eggs. 2 (sometimes 3). "The egg in my Collection coming from inner Australia measures 30.5 × 26 mm. The ground-colour is clay-yellow. Pale grey subjacent and dark grey to brownish superjacent spots are evenly distributed over the whole egg without forming a circlet. The shell is rough to the touch, and without gloss" (Nehrkorn MS.). Creamy-white, dull light stone-colour, or light buff, well covered with irregularly shaped blotches, dots, and spots, and freckles of dull umber and dark sienna-brown, with a few dots and dashes almost black, and obsolete spots here and there of slaty grey; in shape slightly swollen at the thicker end and not pointed; size 33 × 25.4 mm (from Ramsay *a 8*, figured by North *a XIV*).

Nest. None. The eggs are deposited on the bare ground (Bennett *a 9*).

Breeding season. Commences in New South Wales in October or sometimes September (Bennett *a 9*).

Distribution. Australia — from Cape York to inner Australia and New South Wales (Ramsay, etc. *a 12*); New Guinea, Aru, Kei, Salawatti, Waigiou, Tijor, Buru, Obi major (cf. Salvadori *e 1*); Celebes — Gorontalo District (Meyer *a 5* and in Dresd. Mus.), Minahassa (Nat. Coll.), S. Peninsula (Meyer *e 4*, Weber *a 16*, P. & F. Sarasin *9*); Peling Id. (Nat. Coll. in Dresd. Mus.); Timor (Riedel *4*); Rotti (ten Kate *a 15*); Flores (Semmelink *a 4*); Java (Kuhl and van Hasselt *a 4*); Billiton (Vorderman *7*, *8*); Borneo (Schwaner *a 4*).

This curious bird is easily distinguished from other Pratincoles by the greater length of its tarsus, which is considerably more than twice the length of the middle toe without the claw. Its nearest affinities are probably with *Glareola orientalis* in which the tarsus is only one and a half times the length of the

middle toe; the tail of this latter species is deeply forked, not square, and in coloration it wants the deep chestnut patch on the abdomen and sides.

Glareola isabella breeds in Australia and seems only to be a migrant to the East Indies during the cool season in the south. Judging from the fact that we can find notice of only four collectors who have obtained it in Celebes — Meyer, Weber, the Sarasins, and our native hunters — its visitations would appear to be irregular. In 1892 what might almost be termed an irruption seems to have taken place, and in August—September 48 specimens, adults and young, were sent by our native hunters to the Dresden Museum chiefly from the neighbourhood of Lake Tondano. In the two following years not a single example was obtained by the Drs. Sarasin, though very few Celebesian species escaped these zealous naturalists. Like the Sand-grouse in Western Europe, with which the Pratincole has several points of semblance, to wit the greatly lengthened remiges, the general colour, the dark patch on the abdomen (which may have to do with their inhabiting similar barren tracts if there is no real affinity between them), the Pratincole seems to appear as a mysterious wanderer in Celebes, in some years occurring in great numbers, in others, perhaps, not at all. But this remains to be proved. In Billiton, Dr. Vorderman *(7)* says, it occurs in abundance during the East Monsoon (April—October) on the sands at ebb-tide.

An admirable account of the habits of the Long-legged Pratincole, of which few observers have obtained more than glimpses, is given by Mr. H. K. Bennett from the interior of New South Wales *(a 9)*: "This somewhat singular bird is one of the few migratory species that visit this part of the colony and remain during the intense heat of summer. As a rule it arrives towards the end of September and departs about the end of February. During that interval it breeds, and the places chosen for this purpose, and in fact its habitat during its stay are the bare patches of ground, entirely destitute of vegetation, so frequent on the plains here. Some of these bare patches are of considerable extent, and the surface of the ground is broken up into countless small pieces from the size of a pea to that of a walnut . . . It is on these loose patches that the *Glareola* deposits its eggs, 2 in number . . . Usually it is very shy, but during the period of incubation it loses this shyness and both parent birds will allow themselves to be approached quite closely and seem utterly regardless of danger in their anxiety to protect their eggs or young. In fact I have seen the female bird so loath to quit the eggs that it was only when I touched her with my hand, that she would quit the nest, pecking savagely at my hand several times before she did so; the male bird in the mean time lying flat on the ground, with outstretched wings, a few feet off, uttering the most plaintive cries".

"The young in the earlier stages are exceedingly helpless, and although the colour of their down so closely resembles that of the loose pieces of earth amongst which they are hatched that when motionless they are undistinguishable, still

their slightest movement would possibly attract the eye of some passing hawk or crow, and to guard against this danger, the old birds conduct them as speedily as possible to one of the numerous holes in the ground to be found all over the plains (the mouth of some deserted burrow is a favourite place); into this hole the young are led and there they remain until they are able to fly. When the young are concealed in one of these holes, one or both of the old birds may always be seen close by and on the approach of danger I have frequently seen both take refuge in the hole, and on watching for a short time have seen one or both come cautiously out again only to disappear once more on noticing me. This bird is the only living creature I know of that seems to revel in the intense heat of midsummer in this locality, for, when every other animal has sought shelter from the withering mid-day sun, it may be observed running briskly about on the bare red patches I have described, when the surface of the ground is so hot that a man could scarcely bear his hand on it, in fact the hotter the day the more this feathered salamander seems to enjoy it. It, however, requires a good deal of water, for it drinks several times during the day, and often travels many miles going to and returning from the tanks containing water, and numbers can be obtained by waiting at the water until they come to drink".

"These birds run with great rapidity when in quest of food, etc., and suddenly pausing, the body undulates for some seconds as if poised on delicate springs when the running is again resumed. Its flight which appears somewhat laboured from the extreme length of wing is nevertheless light and buoyant and is characterised by the same erratic zig-zag motions so noticeable in the *Eurostopodidae*. Its food consists of insects which are captured both on the ground and on the wing, the bird sometimes running along the ground in pursuit, and springing up to the height of a foot or more as the insect rises, occasionally towering to a considerable altitude as some flying insect attracts its attention, returning to the ground in the skimming zig-zag manner before described".

As in the case of some European species treated of by Naumann, it may be difficult for future observers to add much to Mr. Bennett's description, though so interesting a subject deserves to be much written about.

Glareola orientalis Leach.

Count Salvadori (Orn. Pap. 1882, III, 285) indicates this species as having been found in Celebes by v. Rosenberg, but this appears to be an error; in the reference given (Rosenb., Malay. Archip. 1878, 278) only *Glareola grallaria* is mentioned. Seebohm also (Distr. Charadr. 1887, 259) mentions Celebes as a habitat of *G. orientalis*, quoting as authority Dr. Finsch, but we have not been able to find any confirmation of this. It is probable that *G. orientalis* will be discovered in Celebes, since it ranges from S. E. Siberia and India south to the

Philippines, Borneo, Java, Timor, apparently two or three spots in the Moluccas and Papuasia, and North Australia down to New South Wales, but at present to the best of our knowledge, no reliable record of its occurrence in Celebes is extant.

FAMILY CHARADRIIDAE.

Containing the Plovers, Turnstones, Oyster-catchers, Stilts, Sandpipers, Sanderling, Phalaropes, Snipes, Godwits, and Curlews. Seebohm divided them into three subfamilies after the structure of the foot, Gadow into three subfamilies, closely corresponding with Seebohm's, after the structure of the bill, Sharpe recognises ten subfamilies based upon the formation of the bill, tarsus, and toes. It may be sufficient to mention two extreme forms, *Esacus* and *Scolopax*, between which the others could be arranged in a tolerably unbroken series. *Esacus* has the terminal half of the bill stout, strong, hard, and insensitive, the anterior margin of the nostril reaching to the middle of the bill, the tarsus reticulated before and behind, the toes shorter than the tarsus, and webbed at the base, the hallux wanting: *Scolopax* has the bill very long, slender, terminally soft and highly nervous, the nostril a longitudinal slit near the base of the maxilla, a groove running along the side of the maxilla from the nostril to close to the tip of the bill, the tarsus transversely scutellated before and behind, the toes longer than the tarsus and cleft to the base, a small hallux present. The modifications between these two extremes are pointed out, so far as Celebesian birds are concerned, in our descriptions of the genera.

GENUS ESACUS Less.

This great Plover is placed by Dr. Sharpe in the family *Oedicnemidae* on account of its nasal processes being holorhinal, instead of schizorhinal, but Garrod is said to have abandoned his opinion of the taxonomic value of this character, and in the present case it seems to us that it would make an unnatural division to allow it. *Esacus* is easily distinguishable from the other Plovers occurring in Celebes by its large size, being equal to a Crow or larger, and by its large bill, which is about $1^1/_2$ times as long as the head, and the maxillary groove is hardly noticeable beyond the nostril. No hallux; toes much shorter than the tarsus, webbed at the base for about half the length of the lateral toes; tarsus reticulated in front and behind; tail short, a little longer than the tarsus; wing moderate, first primary absent (?), third a little the longest. Two species, one frequenting river banks, the other the sea-shore; feeding on crustaceans, worms, etc.

314. ESACUS MAGNIROSTRIS (Vieill.).

Big-billed Stone-Plover.

a. **Oedicnemus magnirostris** [Geoffr. MS.?]; *(I)* Vieill., N. D. XXIII, 1818, 231, pl. G 39, f. 1; *(II)* Temm., Pl. Col. 387 (1826); *(3)* Schl., Mus. P.-B., Cursores, 1865, 22; *(4)* Seeb., Distr. Charadr. 1887, 89; *(5)* Everett, J. Str. Br. R. A. S. 1889, 203.

b. **Burhinus magnirostris** *(1)* Less., Tr. d'Orn. 1831, 547, partim.

Esacus magnirostris *(1)* Gray, List Gen. & Subgen. B. 1841, 83; *(II)* Gould, B. Austral. 1848, VI, pl. 6, *(3)* Wall., P. Z. S. 1862, 335, 346; *(4)* Gld., Hb. B. Austr. 1865, II, 213; *(5)* Finsch, Neu Guinea 1865, 181; *(6)* Wald., Tr. Z. S. 1872, VIII, 91; *(7)* Hume, Str. F. 1874, II, 116, 290; *(8)* id., ib. 1875, III, 224; *(9)* id., ib. 1877, V, 121; *(10)* id., ib. 1878, VI, 458; *(11)* Rosenb., Malay. Archip. 1878, 277; *(12)* Legge, B. Ceylon 1880, 974; *(13)* E. L. & L. C. Lay., Ibis 1882, 532; *(14)* W. Blas., J. f. O. 1884, 229; *(15)* Sharpe, Ibis 1888, 203; *(16)* Rams., Tab. List 1888, 19; *(17)* Oates, ed. Hume's Nests and Eggs 1890, III, 334; *(18)* Wiglesw., Av. Polyn. 1892, 63; *(19)* Walker, Ibis 1892, 257; *(20)* Tristr. t. c. 299; *(21)* Grant, Ibis 1896, 127; *(22)* Hart., Nov. Zool. 1896, 180, 250.

c. **Aesacus magnirostris** *(1)* Sundev., Tentamen 1872, 128; *(2)* Rams., Pr. L. Soc. N. S. W. 1882, VII, 40; *(3)* Sharpe, Report Voy. Alert 1884, 26; *(4)* Tristr., Cat. Coll. B. 1889, 24; *(5)* Newton, Dict. B. 1893, 130.

d. **Orthorhamphus magnirostris** *(1)* Salvad., Cat. Ucc. Borneo 1874, 312; *(2)* id., Orn. Pap. 1882, III, 290; *(3)* Vorderm., N. T. Ned. Ind. XLIV, 1885, 204; *(4)* Everett, Ibis 1886, 525; *(5)* Vorderm., N. T. Ned. Ind. LXIX, 1890, 415; *(6)* Heine & Rchw., Nomencl. Mus. Hein. 1890, 333; *(7)* Salvadori, Orn. Pap. Agg. 1891, 198; *(8)* Sharpe, Cat. B. 1896, XXIV, 22, 722.

"Wili-wili" (after the cry of the bird), Celebes, Rosenberg *11.*

For further synonymy and references cf. Salvadori *d 2*, *d 7*; Sharpe *d 8.*

Figures and descriptions. Gould *II*, *4*; Vieillot *a I*; Temminck *a II*; Seebohm *a 4* (woodcut); Hume *7*; Salvad. *d 2*; Sharpe *d 8.*

Adult. Above drab-brown, with dark shaft-streaks, most pronounced on the head; lesser wing-coverts darker brown; the other wing-coverts and inner remiges drab-grey, separated from the lesser coverts by a white bar; primaries brown, the outermost one white about the middle and on most of the inner web, the next two with a large space of white on the inner web only, the two following ones without white except towards base of inner web, the next four white, marked with brown on the first and two inner ones; secondaries white, drab-grey on exposed part of the outer webs, intensifying into a subterminal bar of dark brown; middle tail-feathers drab-brown marked with white and dusky at tip, the others crossed with a bar of white and tipped with black; face with a long superciliary and a subocular stripe black, the latter covering the anterior ear-coverts and meeting the former and passing down the sides of neck; hinder ear-coverts and a broad ring round eye not quite meeting in front white (forming white spectacles); short malar stripe black; chin, throat and rictal region white; under-parts white, becoming drab-grey on breast and jugulum, with dark shaft-streaks on the latter; entire wing below, where it rests upon the body, white; "irides pale yellow; eyelids primrose-yellow; base of the bill sulphur-yellow, which colour is continued along the sides of the upper mandible above the nostrils; tibiae lemon-yellow; tarsi and feet wine-yellow; the upper ridge of the scales of the toes lead-colour" (Gould *4*); wing 285 mm; tail 115; tarsus 90; middle toe 54; bill from forehead 72 (Gorontalo: Riedel — C 878).

Sexes. "The sexes bear a general resemblance to each other, and the young of the first autumn is only distinguished by the feathers being margined with grey" (Gould *4*).

Egg. Apparently only one to a sitting. Oval, fairly smooth-shelled; creamy stone-colour, boldly blotched, streaked and spotted with blackish brown, chiefly at the large end, paling in some places to yellowish or raw Sienna-brown; a few small pale inky-purple subsurface-looking spots and clouds; size 66 × 44.5 mm (from Hume *17*).

Nest. None. Mr. Hume's egg from Little Cocos was found in the coral-sand a little above high-water mark, in a small depression.

Distribution. Cocos and Andaman Is. (Hume *7*, *9*); ?Mergui Is. (Davison *10*); Sumatra, Banka, Java (fide Salvadori *d 2*); Cape Simpang mengaio, Borneo (Everett *d 4*); Philippines — Luzon (Whitehead *21*), Palawan (Whitehead *15*), ?"Philippines and Sooloo" (Peale *d 2*); Celebes — (Reinwardt *a 3*), Gorontalo Distr. (Riedel in Dresd. Mus.); Kalao (Everett *22*); Sula (Allen *3*); Halmahera, Ternate, Raou, Moor, Ceram, Aru, Kei, Waigiou, Salawatti, Batanta, Mysol, Jobi, New Guinea, Admiralty Is., Duke of York, New Britain, Louisiades, Solomon Is., New Caledonia, Yule Id., Ferguson Id. (fide Salvadori *d 2*, *d 7*); N. Australia and N. Queensland (Ramsay *16*).

This giant Plover is a frequenter of the sea-shore, where, as Gould and others observed, it preys upon crabs — for cracking which its bill appears admirably adapted, — "marine insects, worms and various kinds of mollusks". It has rarely been killed in Celebes. Rosenberg, who seems to have been well acquainted with it, probably in Gorontalo, speaks of it as shy, occurring singly on the strand, flying noisily but lightly, and, when put up, uttering a sharp call sounding like "Wili", whence its name. The natives of N. Australia know it as "Weëlo" *(4)*.

Its nearest affinities are with *E. recurvirostris* (Cuv.) of India, the Burmese countries and Ceylon, a smaller, weaker bird with the bill upcurved, confining itself, according to Hume, strictly to sheltered banks of rivers where it feeds on fresh-water shells and crustaceans. In coloration it closely resembles *Esacus magnirostris*, but its upturned bill easily distinguishes it. Salvadori *(d 1)* has found this difference a sufficiently good reason for separating *E. magnirostris* generically from it. Like Mr. Hume, we cannot agree with this proceeding, and trust for once in a way that the distinguished Italian ornithologist will have few followers, even though Dr. Sharpe *(d 8)* is now to be found in his train.

GENUS LOBIVANELLUS Strickl.

Size rather large; bill about as long as the head or longer, a maxillary groove along the basal two-thirds, nostril linear, in the middle of the groove. A small hallux present, the other toes much shorter than the tarsus, which is scutellated in front; tail generally longer than the tarsus. On the face a wattle of variable size; on the carpus a larger or smaller spur.

315. LOBIVANELLUS CINEREUS (Blyth).

Grey-headed Wattled Lapwing.

a. **Pluvianus cinereus** *(1)* Blyth, J. A. S. B. 1842, IX, 587.

b. **Lobivanellus inornatus** *(1)* Temm. & Schl. (nec Sws.), Faun. Jap. Aves 1850, 106, pl. 63; *(2)* Blak. & Pryer, Ibis 1878, 219; *(3)* Tacz., P. Z. S. 1888, 457.

Lobivanellus cinereus *(1)* Blyth, Cat. B. Mus. As. Soc. 1849, 261; *(2)* Schl., Mus. P.-B., Cursores, 1865, 69; *(3)* Seeb., Distr. Charadr. 1887, 183; *(4)* id., B. Japan 1890, 311; *(5)* Styan, Ibis 1891, 503; *(6)* W. Sclater, Ibis 1892, 87; *(7)* Campbell, t. c. 246.

c. **Sarcogrammus inornatus** *(1)* Bp., Compt. Rend. 1856, XLIII, 418, Nr. 89.

d. **Chettusia inornata** *(1)* Jerd., B. India II, 1864, 646; *(2)* Prjev., Rowl. Orn. Misc. 1877, II, 433.

e. **Chaetusia cinerea** *(1)* Blyth, Ibis 1867, 165.

f. **Chettusia cinerea** *(1)* Swinh., P. Z. S. 1871, 403; *(2)* David & Oust., Ois. Chine 1877, 422; *(3)* Hume & Davis., Str. F. 1878, VI, 456; *(4)* Oates, B. Br. Burmah 1883, II, 372; *(5)* C. Swinh., Ibis 1885, 132; *(6)* Oates, Ibis, 1888, 73; *(7)* Hume, Str. F. 1888, XI, 315; *(8)* Tristr., Cat. Coll. B. 1889, 22; *(9)* Hartert, Kat. Vog. Senckenb. Mus. 1891, 215; *(10)* De La Touche, Ibis 1892, 496.

g. **Microsarcops cinereus** *(1)* Sharpe, Cat. B. 1896, XXIV, 133, 732.

For some further references cf. Oates *f 4*, Sharpe *g 1*.

Figures and descriptions. Temminck & Schlegel *b I*; Schlegel *2*; Seebohm *3* (woodcut); Jerdon *d 1*; David & Oustalet *f 2*; Oates *f 4*; Sharpe *g 1*.

Winter plumage. Above deep drab-brown, greyer on head and neck, paler on breast, whitish on chin; remaining under-parts pure white; primaries, primary-coverts and alula black; secondaries and external rows of upper wing-coverts white (in this specimen the outer secondaries tipped with black); upper tail-coverts white; tail white, crossed close to the tip by a broad black band, narrowing laterally, disappearing altogether on the outermost feather; carpus with a large spur (bony knob); a small wattle on the lores; a small hind toe (10 mm); "edges of the eyelids, lappets, and the basal two-thirds of the bill deep yellow, terminal third black; iris red; legs and toes dull yellow; claws black"; wing 235 mm; tail 100; tarsus 81; middle toe with claw 43; bill from feathers of forehead 39 (Gorontalo, Celebes: Riedel — C 273).

Breeding plumage. Head and neck are grey, and the grey of the breast is bounded below by a broad black band.

Eggs. 4 in number, resembling the Common Plover's *(Vanellus cristatus)*, but not so pointed (Japan — Blakiston & Pryer *b 2*).

Nest. "The eggs are laid among the grass growing on the ridges which separate the paddy fields" *(b 2)*.

Distribution. Japan (Siebold *b I*, Blak. & Pryer *4*); Corea (Kalin. *b 3*, Campb. *7*); S. E. Mongolia (David *f 2*, Prjevalsky *d 2*); China (David *f 2*, Swinh. *f 1*, etc.); India Jerdon *d 1*, Hume, etc.); Burmah (Oates *d 4*, *d 6*); Tenasserim (Davison *f 3*); Ceylon (Nevill *g 1*); N. Celebes — Gorontalo (Riedel in Dresden Mus.).

The Grey-headed Plover is a new addition to the avifauna of Celebes. There is a single specimen in the Dresden Museum obtained almost 30 years ago by Dr. Riedel in the Gorontalo District. Its occurrence there is somewhat

remarkable, as it does not appear to have been discovered as yet in either the Philippines, Borneo or Java. It is, however, a migratory species, and may safely be regarded as a winter visitor to Celebes, though perhaps an irregular or, even, casual one. David and Prjevalsky observed that it breeds in Mongolia, and Blakiston and Pryer found its eggs near Tokio; Styan also observes that a few remain to breed about the Lower Yangtse. According to David it visits China and Mongolia in summer, also Corea, as Kalinowski found, where it is numerous, but absent in winter. It makes its appearance on the Lower Yangtse in flocks in February, most of them passing on, no doubt north, in April *(5)*; in South China Mr. De La Touche observed it occasionally in spring. In the winter it descends to India and Burmah.

Like the Common Lapwing it is of gregarious habits. Its cry is likened by Davison *(f 3)* to the expression "did-all-eat", but the Abbé David speaks of it as harsh and disagreeable. It frequents swamps, ploughed land, etc., and, according to Davison, it feeds entirely upon insects.

Seebohm points out that *L. cinereus* may easily be distinguished from its nearest allies by its white secondaries. *Lobivanellus miles*, which ranges from N. Australia to Amboina (Salvad.), has very large pendant wattles covering the face in front of the eye, the neck white all round like the under-parts, the head above black, and is, therefore, far removed from the present species.

In this species the pollex is developed into a considerable spur on the carpal edge[1]). Its object is no doubt for fighting with rivals and for driving foes away. The Common Lapwing in which the spur is present, though less developed, may always be seen during the breeding-season "stooping" and plunging down in the air at approaching Crows; in fighting it has been seen to plunge time after time at a rival on the ground, a noise being heard each time as if a blow had been given with the wing upon the other's back as the bird turned in its flight and rose again (Wiglesw., autumn 1895 — Moritzburg). Probably it is thus in rushing flight that wing-spurs are always used; on the ground, fighting like a cock, they would be of little or no use.

GENUS SQUATAROLA Leach.

Similar to *Charadrius*, but having a small hallux. A single migratory species, of almost cosmopolitan distribution.

316. ? SQUATAROLA HELVETICA (L.).

Grey Plover.

a. **Charadrius squatarola** (L); *(I)* Naum., V. Deutschl. VII, 1834, 249, t. 178.
Squatarola helvetica (L); *(I)* Gould, Birds Austr. 1848, VI, pl. 12; *(II)* Dresser, B. Europe VII, 455, pls. 515, 517, 518 (1871); *(III)* Dress., ib. 465, pl. 519 (1876);

[1]) Dr. Sharpe *(g 1)* wrongly states that the spur is absent and puts the bird in a new genus.

(4) Legge, B. Ceylon 1880, 929; *(5)* Salvad., Orn. Pap. 1882, III, 293; *(6)* Baird, Brew. & Ridgw., Water B. N. Am. 1884, I, 132; *(7)* Everett, J. Str. Br. R. A. S 1889, 204; *(8)* Steere, List B. & M. Philipp. Is. 1890, 25; *(9)* Sh. & Whitehd., Ibis 1891, 141; *(10)* De La Touche, Ibis 1892, 496; *(11)* Hose, Ibis 1893, 424; *(12)* Tacz., Faun. Orn. Sib. Orient. 1893, II, 835; *(13)* Newton, Dict. B. 1894, 731, 732; *(14)* Hart., Nov. Zool. 1896, 250; *(15)* Sharpe, Cat. B. 1896, XXIV, 182, 737.

b. **Pluvialis varius** (Briss.); *(1)* Rosenb., Malay. Archip. 1878, 278.

c. **Charadrius helveticus** *(1)* Seeb., Distr. Charadr. 1887, 102; *(2)* Whitehd., Ibis 1891, 59.

For further synonymy and references cf. Naumann *a I*; Sh. & Dresser *II*; Legge *4*; Salvad. *5*; Seebohm *c 1*; Taczanowski *12*; Sharpe *15*; etc.

Figures and descriptions. Naumann *a I*; Gould *I*; Sharpe & Dresser *II*, *III* (chick); Legge *4*; Baird, Brewer & Ridgw. *6*; Seebohm *c 1*; Sharpe *15*; etc.

Diagnosis. Like *Charadrius fulvus*, but with a minute hind-toe[1]), black axillaries, a larger bill, and general size larger.

Measurements. Wing ca. 195; tail 85; tarsus 46; bill from forehead 29 mm.

Distribution. Europe; Africa; Asia; Australia; N. and Central America.

The Grey Plover breeds in the far North and in autumn it makes its way to South Africa, to South Asia, and onward through the East Indian Archipelago to Australia and Tasmania, while, in America, it visits the West Indies and Central America. It has been encountered on all sides of Celebes as a winter visitor or bird of passage — in the Philippines, as Salvadori shows, by Meyer and Layard, also by Steere, in Borneo by Diard and many others, in Java by Horsfield, Kuhl and van Hasselt, in Halmahera by Wallace and Bernstein, in Timor by Salomon Müller. There can therefore be no reasonable doubt that the bird occurs in Celebes also, though at present the only record of its occurrence there consists in its name being put down in Rosenberg's *(b 1)* list, which without confirmation by actual specimens is, as we have already stated, quite insufficient evidence.

The breeding grounds of this species long remained unknown to ornithologists, to be found first in 1843 by v. Middendorff in Northern Siberia, then in 1864—1865 by Mac Farlane on an island in Franklin Bay on the arctic coast of America. Of its breeding in Europe a graphic account has been given by Seebohm, who with Harvie-Brown succeeded in finding many nests on the tundra of the Petchora in June—July, 1875. The eggs are described by Seebohm as intermediate between those of the Golden Plover and the Pewit, and the nests were found among the tussocks intersecting the boggy land; one is described as "a hollow, evidently scratched, perfectly round, somewhat deep, and containing a handful of broken slender twigs and reindeer moss".

Squatarola is separated generically from *Charadrius* in virtue of its possessing a diminutive hind toe; this is not seen in *Charadrius*. It is likely that *Squatarola* presents the type of the *Charadriine* foot of a former age, for it appears certain

[1]) Sharpe & Dresser figure *C. fulvus* (pl. 516) with a small hind toe; this is of course wrong.

that *Charadrius*, like many other Waders, once had the fourth toe and has lost it; and it is more probable that *Squatarola* has not quite lost it yet, than that it lost it a period ago and has now regained it.

GENUS CHARADRIUS L.

Bill about as long as the cranium, slightly recurved, terminal third forming a dertrum, or solid, slightly swollen tip, maxillary groove along the basal two-thirds; tarsus and lower half of tibia reticulated; no hallux; toes shorter than tarsus; tail of 12 rectrices, nearly square, longer than the tarsus; wing long, pointed, the first primary abortive and concealed, the next the longest; secondaries less than half its length, except the inner ones which are much lengthened. Plumage above spangled with golden tawny and black, throat and breast in summer black. Migratory; almost cosmopolitan.

317. CHARADRIUS FULVUS Gm.

Eastern Golden Plover.

Charadrius fulvus *(1)* Gm., S. N. 1788, I, 687 (ex Lath. & Forster); *(2)* Finsch & Hartl., Orn. Centralpolyn. 1867, 197; *(III)* Sh. & Dress., B. Europe VII, 443, pls. 516, 517 (1871); *(4)* Wald., Tr. Z. S. 1872, VIII, 88; *(5)* Salvad., Cat. Ucc. Borneo 1874, 313; *(6)* Hume, Str. F. 1874, II, 287; *(7)* Brügg., Abh. Ver. Bremen 1876, V, 88; *(8)* D. & O., Ois. Chine 1877, 424; *(9)* Hume & Davis., Str. F. 1878, VI, 455; *(10)* Lay., Ibis 1878, 262; *(11)* id., ib. 1879, 107; *(12)* Meyer, t. c. 146; *(13)* Legge, B. Ceylon 1880, 934; *(14)* Rosenb., Zool. Garten 1881, 167; *(15)* Lay., Ibis 1881, 135; *(16)* id., ib. 1882, 532, 544; *(17)* A. Müll., J. f. O. 1882, 434; *(18)* Salvad., Orn. Pap. 1882, III, 294; *(19)* Oates, B. Br. Burmah 1883, II, 364; *(20)* W. Blas., J. f. O. 1883, 139; *(21)* Sharpe, Report Voy. Alert 1884, 27; *(XXIbis)* Seeb., Brit. B. 1885, III, 40, pl. 25; *(22)* Guillem., P. Z. S. 1885, 559; *(23)* W. Blas., Z. ges. Orn. 1886, 140; *(24)* Büttik., Notes Leyd. Mus. 1887, IX, 79; *(25)* Seeb., Distr. Charadr. 1887, 99; *(26)* Buller, B. New Zeal. 2nd ed. 1888, II, 6; *(27)* Rams., Tab. List 1888, 19; *(28)* W. Blas., Ornis 1888, 319; *(29)* Everett, J. Str. Br. R. A. S. 1889, 204; *(30)* Hagen, T. Ned. Aard. Genoots. 1890, (2) VII, 163; *(31)* Seeb., B. Japan 1890, 303; *(32)* Steere, Philipp. List 1890, 25; *(33)* Whitehd., Ibis 1890, 59; *(34)* Sharpe, t. c. 142; *(35)* Styan, ib. 1891, 503; *(36)* Salvad., Agg. Orn. Pap. 1891, 200; *(37)* id., Ann. Mus. Civ. Gen. 1891, (2) XII, 75; *(38)* Gätke, Vogelw. Helgol. 1891, 484; *(39)* Wiglesw., Av. Polyn. 1892, 63; *(40)* Wilson, B. Sandw. Is. pt. III, 1892; *(41)* Büttik., Zool. Erg. Weber's Reise 1893, III, 281, 305; *(42)* Taczan., Faun. Orn. Sib. Orient. 1893, II, 815; *(43)* M. & Wg., J. f. O. 1894, 251; *(44)* Newton, Dict. B. 1894, 732; *(45)* Bns. & Worces., B. Menage Exp. 1894, 31; *(46)* Hartert, Nov. Zool. 1894, 483; *(47)* Everett, Ibis 1895, 32; *(48)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 17; *(49)* iid., ib. Nr. 9, p. 8; *(50)* Vorderm., N. T. Ned. Ind. 1895, LIV, 351; *(51)* Hart., Nov. Zool. 1896, 180.

a. **Charadrius xanthocheilus** Wagl.; *(1)* Gould., B. Austr. 1848, VI, pl. 13.

b. **Charadrius longipes** "Temm."; *(1)* Swinh., Ibis 1863, 404; *(2)* A. Müll., J. f. O. 1882, 434.

c. **Charadrius pluvialis orientalis** *(1)* Temm. & Schl., Fauna Jap. Aves 1850, 104, pl. 62.

d. **Pluvialis fulvus** *(1)* Schl., Mus. P.-B., Cursores, 1865, 50; *(2)* Rosenb., Malay. Archip. 1878, 278; *(3)* Ribbe, Jb. Ver. Erdk. Dresden 1892, 172.

e. **Charadrius dominicus fulvus** *(1)* Baird, Brew. & Ridgw., Water B. N. Am. 1884, 144.

f. **Charadrius pluvialis** var. **fulvus** *(1)* Oust., Nouv. Arch. du Mus. 1894, (3) VI, 92.

g. **Charadrius dominicus** P. L. S. Müll.; *(1)* Sharpe, Cat. B. 1896, XXIV, 195, 738.

"**Kuwiel**", Minahassa, Nat. Coll.

"**Bararanga waila**", Talaut Is., iid.

For further synonymy and references cf. Finsch & Hartl. *2*; Salvadori *5*, *18*, *36*; Sharpe & Dresser *III*; Legge *13*; Wiglesw. *39*; Wilson *40*; Sharpe *g 1*; etc.

Figures and descriptions. Gould *a I*; Temm. & Schlegel *c I*; Sharpe & Dresser *III*; Seebohm *XXI*^{bis}; Finsch & Hartl. *2*; Legge *13*; Salvadori *18*; Sharpe *g 1*; etc.

Adult in breeding plumage. Above spangled all over with orange-buff and black (the middle of the feathers being black, the buff forming spots on the sides and tips), head above blacker, inner wing-coverts greyer; remiges and outer wing-coverts dusky, the shafts of the remiges and edges and tips of the longer coverts white; tail dusky, crossed with about 6 bars of pale brown, these becoming white on the outermost feathers, tip whitish; forehead, superciliary stripe and sides of neck buff-white, sides of body and under tail-coverts white mixed with black; lores, cheeks, ear-coverts, throat, breast and abdomen black; wing below and axillaries drab, the under feathers of the latter notched and tipped with white; "bill black; feet greyish; iris dusky brown": Sh. & Dr. *III* (Japan — C 11316).

Sexes. The sexes are similar, but Sharpe and Dresser express the opinion that the female probably assumes the breeding plumage less early in the season than the male. Probably the black of the under-parts is less pure.

Adult in winter plumage. Above a good deal as in summer, but blacker, and the feathers margined, not spotted (except towards scapulars, rump, upper tail-coverts), with orange-buff; under-parts entirely without black; forehead, superciliary region, cheeks and chin fulvous white, passing into drab-grey with pale fulvous margins on jugulum and upper breast; remaining under-parts white, a few brown spots about the under tail-coverts and flanks; wing below as in summer (Kabruang: Nov. 1893: Nat. Coll. — C 13034).

Observation. Many individuals are killed in Celebes in transition-plumage between summer and winter dress: in August—September with the under-parts and face with black feathers intermixed with the grey-brown and white of the winter dress (Minahassa — C 10842), in July (♂, Limbotto — C 1962) in incomplete summer dress, in March (Manado — C 1964) with much black below. Out of 24 specimens killed by our native hunters near Tondano in Aug.—Sept., 1892, all except one had more or less black feathering intermixed with the pale brown of the breast. We have never seen an adult from Celebes in full breeding plumage.

Young in first (winter) plumage. Like the adult in winter plumage, but the feathers of the upper surface spotted, not margined, with orange-buff; below dull buff, throat and breast spotted with dusky, continued as somewhat obscure bars on the lower under-parts (which are, therefore, not pure white); tail notched with buff or whitish, not barred right across; "bill black; legs slate-grey" (♂, Kema, 6. Oct. 93: P. & F. S).

Observation. It is at first rather difficult to decide which is the adult in winter and which the young, as the upper surface of the latter is like that of the adult in summer. The two are correctly distinguished by Seebohm *(XXI*^{bis}*)*.

Measurements (20 specimens from Celebes and Talaut). Wing 155—175 mm; tail ca. 60; tarsus ca. 44; bill from forehead ca. 25. See, also, W. Blasius *23*; Finsch & Hartl. *2*.

Egg. Light buff to very pale buff with a slight olive tinge, blotched and spotted with rich brown; grey underlying markings small and comparatively few; size 47—48.8 × 32.3—33.3 mm (from Seebohm *XXI*^{bis}).

Nest. One found by Seebohm in the valley of the Yenesei was "merely a hollow in the ground, upon a piece of turfy land, overgrown with moss and lichen, and was lined with broken stalks of reindeer moss *(XXI*^{bis}*)*.

Distribution. Asia; Alaska; Polynesia; throughout the East Indies; Australia; New Zealand; N. E. Africa; Europe as a straggler (cf. Sharpe and Dresser *III*; Salvadori *5*, *18*, *36*; Legge *13*; Baird, Brewer & Ridgw. *e 1*; E. P. Ramsay *27*; Buller *26*; Wiglesw. *39*; Taczanowski *42*).

In the Celebesian area: — Minahassa (Meyer *12*, etc.); Gorontalo Distr. (Forsten *d 1*, etc.); Gulf of Boni — Luwu (Weber *41*); Togian (Meyer *12*); Talaut Is. (Nat. Coll. *43*, *49*); Saleyer (Everett *51*).

This species, the eastern representative of the Golden Plover, *C. pluvialis*, of Europe, is distinguishable from that bird by its grey axillaries (not white), and smaller size. The American form, *C. dominicus*, is less easily if at all to be separated, but, as Prof. W. Blasius *(23)* and others point out, while the bill and tarsus of *C. fulvus* are as long or longer, its wing and tail are notably shorter than in the American bird; the latter is also said to have one or two more bars on the tail. Dr. Sharpe, however, has found that they seem to overlap to such an extent that their distinction does not appear advisable.

C. fulvus is undoubtedly a great migrant, the main body of the species probably breeding in Siberia, where its eggs have been found by v. Middendorff *(III, 42)*, and there are carefully identified specimens taken by Seebohm *(XXI*^{bis}*)*; Nelson also recorded it as breeding on both coasts of the Bering Sea *(42)*. It breeds, nevertheless, in New Caledonia, as shown by Mr. Layard *(10, 11, 15, 16)*, and Sir Walter Buller *(26)* records the discovery of a nest and eggs on Portland Island, New Zealand. In North Celebes Meyer got this Plover at Limbotto in July and on Togian Island in August; some birds, therefore, remain throughout the year, but, as already remarked, we have seen none in breeding plumage. Finsch says that it is found throughout the year on the Gilbert and Marshall atolls, and our artist, Mr. B. Geisler, tells us that this is the case in New Britain. Swinhoe described it as common all the year round in Formosa *(b 1)*, but the supposed eggs obtained by him are discredited by Seebohm (Ibis 1879, 154), Legge (B. Ceylon 1880, 942), and Harting (P. Z. S. 1882, 355), who hold them for those of *Aegialitis geoffroyi*. Sufficient, however, is known to show that many individuals of a great migratory species remain behind in their winter quarters, and some of them even breed there. Such facts seem to throw some light upon the nature of the migratory instinct in birds, as also upon a process — one of many — of colonisation by birds, affecting the questions of geographical distribution.

GENUS AEGIALITIS Boie.

Structurally like *Charadrius*, but the upper surface fairly uniform brown in coloration, not spangled, and the size generally smaller. The scaling of the tarsus is variable, being sometimes reticulate and sometimes scutellate anteriorly, and this in species which are undoubtedly closely allied (e. g. *A. geoffroyi* and *A. mongola*). Generally migratory; almost cosmopolitan.

318. AEGIALITIS VEREDA (J. Gd.).

Oriental Dotterel.

a. **Charadrius veredus** *(1)* Gould, P. Z. S. 1848, 38; *(II)* id., B. Austr. 1848, VI, pl. 14; *(3)* Seebohm, Ibis 1882, 425; *(4)* id., Distr. Charadr. 1887, 115; *(5)* id., B. Japan 1890, 311, note; *(6)* Styan, Ibis 1891, 503.

b. **Cirrepidesmus asiaticus** *(1)* Gould (nec Pall.), Handb. B. Austr. 1865, II, 229.

c. **Charadrius asiaticus** *(1)* Schl., Mus. P.-B., Cursores, 1865, 38, pt.; *(2)* Rosenb., Malay. Archip. 1878, 277.

d. **Eudromias veredus** *(I)* Harting, Ibis 1870, 209, pl. VI; *(2)* Wald., Tr. Z. S. 1872, VIII, 88; *(3)* Swinh., Ibis 1873, 365; *(4)* Ball, Str. F. 1873, I, 83; *(5)* Hume, ib. 1874, II, 288; *(6)* Salvad., Cat. Ucc. Borneo 1874, 315; *(7)* Prjev., Rowl. Orn. Misc. 1877, II, 434; *(8)* Rams., Tab. List 1888, 19; *(9)* Tristr., Cat. Coll. B. 1889, 21.

Aegialitis vereda (or **veredus**), *(1)* Swinh., P. Z. S. 1870, 141; *(II)* David & Oust., Ois. Chine 1877, 425, pl. 120; *(3)* Hume, Str. F. 1878, VII, 438; *(4)* id., ib. 1879, VIII, 200; *(5)* Salvad., Orn. Pap. 1882, III, 296; *(6)* W. Blas., Z. ges. Orn. 1886, 143; *(7)* id., Ibis 1888, 374; *(8)* id., Ornis 1888, 319; *(9)* Whitehead, Ibis 1890, 58; *(10)* Salvad., Orn. Pap. Agg. 1891, 200; *(11)* De La Touche, Ibis 1892, 496.

e. **Ochthodromus veredus** *(1)* Sharpe, Cat. B. 1896, XXIV, 232, 741.

"**Manna**", Talaut Islands, Nat. Coll.

For further synonymy and references cf. Salvadori *5*; Sharpe *e 1.*

Figures and descriptions. Gould *a II* (juv.); Harting *d I*; David & Oust. *II*; Seebohm *a 4* (woodcut); Salvadori *5*; Sharpe *e 1.*

Adult male in summer. Head and neck pure white, with a small patch of greyish brown on the nape; remaining upper parts clear earthy brown; breast tawny rufous (roux fauve) bounded below by a black band; remaining under-parts pure white; remiges brown; centre tail-feathers earthy brown, the lateral ones similar, tipped with white, the outermost ones pure white; iris brown; wing 170 mm; tail 60; tarsus 46; middle toe 20; bill from forehead 21 (David & Oustalet *II*: China).

Swinhoe describes the soft parts thus: bill deep olive-brown, blacker on the terminal portion; eyelids greyish black; legs light brownish flesh-colour; feet washed with grey, blackish on joints, claws black.

Young. "Crown, back and upper portion of the wings greyish brown, each feather margined with buff; forehead, eyebrows, chin, sides of face and neck buff, this colour extending in the form of a collar round the neck; the pectoral band not well defined, but a cloudy patch of pale buffy brown, extending across the breast, becomes gradually paler above and below as it approaches the chin and vent; primaries and axillaries as in the adult [axillaries smoke-grey]; secondaries broadly edged with buff" (Harting *d I*).

Adult in winter plumage. It has not yet been discriminated from the young. Two specimens

from v. Schierbrand (Java) in the Dresden Museum, answering pretty well to Mr. Harting's description above, might be adult birds; they do not, however, display anything of the dusky patches on the sides of the breast which Mr. Harting supposes the adult to possess in winter. One specimen from Talaut has broad cinnamon edgings to the feathers of the upper surface (young?), a second is nearly uniform (adult?).

Chick, eggs, nest. Undescribed. The species has, however, been observed breeding in Mongolia by David *(II)* and Prjevalsky *(d 7)*.

Distribution. South-west Siberia — Samarkand (fide Seebohm *a 3*); Mongolia (David *II*, Prjevalsky *d 7*); China (Swinhoe *d 3*, Styan *a 6*, etc.); Cambodia (Conrad *a 5*); Andamans (Ball *d 4*); Java (Horsfield *5*, v. Schierbrand); Philippines — Palawan (Platen *7*, *8*); Talaut Islands — Karkellang (Nat. Coll. in Dresd. Mus.); Celebes — Gorontalo Distr. (Riedel *6*), Macassar (Wallace *a II*, *d I*, *d 2*, *e 1*); Ternate, Amboina, New Guinea, Kei, Aru (Salvad. *5*); N. and E. Australia (Ramsay *d 8*).

This rare Plover has been met with, no doubt as a winter visitor or bird of passage, only by Wallace and Riedel in Celebes. A specimen from Riedel in the Brunswick Museum, one (? from Wallace) in the same collection recorded by W. Blasius *(6)*, four in the British Museum and one in the Dresden Museum are the only examples from the island of which we can find notice. Two in winter plumage were obtained in Talaut in the autumn, 1896, by our native hunters. In Mongolia David found it plentiful: "It establishes its breeding-quarters on high plateaus, among stony plains, on the shores of the bitter lakes and of the rare water-courses with which the country is supplied. It runs on the ground with extreme lightness and astonishing rapidity, and feeds on small insects, principally *Coleoptera* of the genera *Asida*, *Gonocephalus* and *Tentyria*, which abound in summer in the sandy regions". Prjevalsky met with it on the salt plains of S. E. Mongolia, sometimes at great distances from the water. It was very shy, even when it had young.

Abbé David further observes that it passes through China as a bird of passage, residing there only accidentally; Mr. Styan *(a 6)* on the Lower Yangtse and Mr. De La Touche *(11)* in the South China (Foochow) likewise remarked that it passes on in migration. In all probability the birds found in the East Indies and Australia are members of this southern wandering from Mongolia and other suitable breeding areas in the neighbouring territories.

A. vereda most closely resembles *A. asiatica* (Pall.), from which it may, however, readily be distinguished by its greater size (wing 20—25 mm longer), its drab-brown axillaries (white in *asiatica*), the dusky shafts of the remiges, except the first two (all being white in *asiatica*), — characters pointed out among other marks of distinction by Mr. Harting *(d I)*. Compared with the other Plovers of the genus *Aegialitis* in Celebes it may at once be distinguished from *A. geoffroyi* and *mongola* by its grey-brown under-wing, by its pale brownish flesh-coloured legs, as against slaty-grey or blackish in those species, by its middle toe without the claw being less than half the length of the tarsus, and by its much more slender bill. *A. peroni*, *curonica* and *jerdoni* do not come into question, on account of their small size and black markings about the head.

319. AEGIALITIS GEOFFROYI (Wagl.).

Greater Shore Plover.

a. **Charadrius geoffroyi** *(1)* Wagl., Syst. Av., Charadrius, 1827, sp. 19; *(II)* Kittl., Kupfert. 1833, 26, t. 34, fig. 2; *(3)* Schl., Mus. P.-B., Cursores, 1865, 39; *(4)* Hartl., Vög. Madag. 1877, 286; *(5)* Rosenberg, Malay. Archip. 1878, 277; *(6)* Milne-Ed. & Grandid., Ois. Madag. 1879, I, 507; *(7)* Severtz., Ibis 1883, 80; *(8)* Fischer, J. f. O. 1885, 115; *(9)* Sharpe, Ibis 1886, 492; *(10)* Seebohm, Distr. Charadr. 1887, 146; *(11)* Lister, P. Z. S. 1888, 528; *(12)* Rchw., J. f. O. 1889, 265; *(13)* Seebohm, B. Japan 1890, 310; *(14)* Styan, Ibis 1891, 503; *(15)* Emin, J. f. O. 1891, 338; *(16)* Büttik., Notes Leyd. Mus. 1891, XIII, 215; *(17)* id., ib. 1892, XIV, 204; *(18)* Ribbe, Jb. Ver. Erdk. Dresden 1892, 172; *(19)* Büttik., Zool. Erg. Weber's Reise 1893, III, 282; *(20)* Styan, Ibis 1893, 436.

b. **Charadrius leschenaulti** *(1)* Less., Man. d'Orn. 1828, II, 322.

c. **Cirrepidesmus geoffroyi** *(1)* Bp , C. R. 1856, XLIII, 417, Nr. 49; *(2)* Hume, Str. F. 1874, II, 288; *(3)* id., ib. 1876, IV, 12; *(4)* id., ib. 1877, V, 232, 236; *(5)* Heine & Rchw., Nomencl. Mus. Hein. 1890, 336.

d. **Charadrius longipes** *(1)* Swinh., Ibis 1864, 404, partim (eggs).

Aegialitis geoffroyi *(1)* Jerd., B. Ind. 1864, 638; *(II)* Harting, Ibis 1870, 378, pl. XI; *(3)* Hume, Str. F. 1873, I, 229; *(4)* Legge, t. c. 489; *(5)* Salvad., Cat. Ucc. Borneo 1874, 318; *(6)* id., Ann. Mus. Civ. Gen. 1876, IX, 63; *(7)* Hume, Str. F. 1876, IV, 437, 444, 463; *(8)* D. & O., Ois. Chine 1877, 426; *(9)* Oust., Bull. Soc. Philom. 1877, 181; *(10)* Hume & Davis., Str. F. VI, 1878, 455; *(XI)* Dresser, B. Eur. 1878, VII, 475, pls. 520, 521; *(12)* Hume, Str. F. VIII, 1879, 157, 200; *(13)* Legge, B. Ceylon 1880, 939; *(13bis)* Wardl. Rams., Tweedd. Orn. Works 1881, Index, 659; *(14)* Kelh., Ibis 1882, 9; *(15)* Harting, P. Z. S. 1882, 355; *(16)* Oates, Str. F. 1882, IX, 237; *(17)* Salvad., Orn. Pap. 1882, III, 298; *(18)* Sclat., P. Z. S. 1883, 200; *(19)* Oates, B. Brit. Burmah 1883, II, 366; *(20)* Forbes, P. Z. S. 1884, 433; *(21)* Sharpe, Ibis 1884, 322; *(22)* Meyer, Isis, Dresden 1884, 6, 55; *(23)* Guillem., P. Z. S. 1885, 559; *(24)* Nehrkorn, J. f. O. 1885, 35; *(25)* Dedit., t. c. 208; *(26)* Sharpe, Ibis 1886, 167; *(27)* W. Blas., Z. ges. Orn. 1886, 146; *(28)* Salvad., Ann. Mus. Civ. Gen. 1886, (2) IV, 561; *(28bis)* Gigl., Avif. Italica 1886, 371; *(29)* Sclat., Ibis 1886, 517; *(30)* Sharpe, Ibis 1888, 203; *(31)* Shell., t. c. 305; *(32)* Hume, Str. F. 1888, XI, 313; *(33)* Lilf., Ibis 1888, 104; *(34)* Rams., Tab. List 1888, 19; *(35)* W. Blas., Ornis 1888, 319, 627; *(36)* Lilf., Ibis 1889, 338; *(37)* Dresser, Ibis 1889, 92; *(38)* Everett, J. Str. Br. R. A. S. 1889, 205; *(39)* Tristr., Cat. Coll. B. 1889, 19; *(40)* Vorderm., N. T. Ned. Ind. 1890, XLIX, 415; *(41)* Sh. & Whitehd., Ibis 1890, 143; *(42)* Sh., ib. 284; *(43)* Steere, List B. Philipp. Is. 1890, 25; *(44)* Salvad., Orn. Pap. Agg. 1891, 200; *(45)* Wiglesw., Av. Polyn. 1892, 64; *(46)* Sibree, Ibis 1892, 115; *(47)* De La Touche, t. c. 496; *(48)* Blanf., Ibis 1894, 574; *(49)* M. & Wg., J. f. O. 1894, 251; *(50)* Bns. & Worces., B. Menage Exp. 1894, 31; *(51)* Everett, Ibis 1895, 34; *(52)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 17; *(53)* Grant, Ibis 1896, 126; *(54)* Salvadori, Ann. Mus. Civ. Gen. 1896, (2) XVI, 118; *(55)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 2, p. 20.

e. **Eudromias geoffroyi** *(1)* Meyer, J. f. O. 1873, 405; *(2)* Severtz., J. f. O. 1875, 182; *(3)* Lenz, J. f. O. 1877, 379; *(4)* Meyer, Ibis 1879, 141; *(5)* W. Blas., J. f. O. 1883, 118; *(6)* Meyer, ib. 150.

f. **Ochthodromus geoffroyi** *(1)* Sharpe, Cat. B. 1896, XXIV, 217, 740; *(2)* Büttik., Notes Leyden Mus. 1896, XVIII, 193.

"Bararanga nusahatan", Talaut, Nat. Coll.
"Kingkedudu kadio", Siao, iid.
"Lorie" (Shore-bird), Minahassa, iid., — many species having the same name.
"Alalang", Peling, iid.
For further synonymy and references cf. Harting *II*; Dresser *XI*; Salvadori *17*, *44*; Sharpe *f 1.*
Figures and descriptions. Kittlitz *a II*; Harting *II*; Dresser *XI*; Seebohm *a 10* (head — summer); Legge *13*; Salvadori *17*; Sharpe *f 1.*
Adult in winter plumage. Above, together with sides of breast, drab-brown, with paler tips to the feathers; wing-coverts and remiges darker brown, alula blackish, the greater wing-coverts margined and broadly tipped with white, inner primaries and outer secondaries partly white on outer web; tail-feathers dark drab, tipped with white, the outermost pair almost pure white; entire under-parts, with wing below, forehead, cheeks and a mark above the ear-coverts white; in front of eye dusky, paler on lores; ear-coverts drab; "iris dark brown; bill black; legs bluish grey; feet black-grey" (♂, Kema, N. Celebes, 16. Aug. 1892: P. & F. Sarasin).
Observation. All Celebesian specimens seen by us are in winter or young plumage, or imperfect summer plumage.
Male in breeding plumage. A broad patch of black passing from the lores through and below the eye on to the ear-coverts; a bar of black from the eye above across the fore crown; anterior part of forehead white; head above russet; a broad band of rusty red across the breast; for the rest much as in winter plumage.
Female in breeding plumage. It "differs from the male in lacking the black stripes over the fore crown and through the eye, these parts being brownish grey; the breast is paler rufous, and the upper parts are rather darker and duller" (Dresser *XI*).
Sexes. Equal in size (Hume *3*).
Young. Much like the adult in winter; the feathers above margined with pale buff, and in lieu of the pectoral band a buff spot on each side of the breast; bill, legs and toes lighter than in the adult (from Harting *II*).

Measurements.	Wing	Tail	Tarsus	Bill from forehead
a. (C 895) ♀, Limbotto, July 71 (Meyer)	139	54	39	—
b. (Sarasin Coll.) ♂, Kema, Aug. 16. 92	134	53	38	22
c. (C 3534) Minahassa (Faber)	143	51	38	22.5
d. (C 10940) near Manado, Aug.– Sept. 92 (Nat. Coll.)	—	52	37.5	23
e. (C 10941) near Manado, Aug.—Sept. 92 (Nat. Coll.)	134	50	38	24.5
f. (C 12651) Siao, 19. July 93 (Nat. Coll.)	136	53	36.5	23.5
g. (C 13032) Kabruang, 8. Nov. 93 (Nat. Coll.)	139	51	38.5	24
h. (C 13031) Kabruang, 8. Nov. 93 (Nat. Coll.)	137	50	37.5	23.5

Observation. The specimens killed in the Minahassa in August and September *(b, d, e)* and the two shot at Talaut in November *(g, h)* are moulting their remiges, the longer primaries in the first four cases being old feathers and the inner primaries and some or all the secondaries new feathers, in some cases growing. At the same time the feathers of the upper surface are old and worn, and it is clear that on these parts the birds are in the worn plumage of summer. As to the under-parts it is more difficult to form an opinion, but the feathers are soft and in good condition; from this appearance, and from the circumstance that nothing of the russet breast-band of the breeding plumage is seen, we conclude that the birds have already passed through the moult on this part. Therefore it is probable that the under plumage is moulted

first; then the quills on arrival in its winter quarters, in August—November, or about the same time if it spends the summer there; and finally the feathers of the upper parts.

Eggs. Cream-yellow, blotched chiefly at the larger end with pitch-black: size 35.5 × 25.4 mm (Harting *15* — Madagascar). Some eggs described from Formosa by Swinhoe *(d 1)* as those of *Charadrius longipes* are almost certainly those of this species, as was first supposed by Seebohm (Ibis 1879, 154) and Legge *(13)* and afterwards confirmed by comparison with Harting's specimens. Four in number (Swinhoe *d 1*).

Nest. A loose nest of dried grasses and fibres placed in a hollow (Swinhoe *d 1* — from the south-west marshy plains of Formosa).

Distribution. Asia, except (as yet) Siberia; Africa, East Coast from Egypt to Central Africa (Emin *a 15*) and the Cape, also Benguela; Madagascar, the Seychelles, Mauritius; East India Islands; Australia; N. W. Polynesia; Europe — a rare straggler (cf. Dresser *XI*; Legge *13*; Hartlaub *a 4*; Milne-Ed. & Grandid. *a 6*; Salvadori *17, 44*; Sharpe *f 1*; Ramsay *34*; Wiglesworth *45*); India (Blyth *17*, Hume *3*, *c 3*, etc.); Ceylon (Legge *13*); Laccadive Is. (Hume *7*); Andamans, Nicobars (Hume & Davison *c 2*); Christmas Island. (Lister *a 11*); Burmah (Oates *19*); Tenasserim (Armstrong *10*); Malay Peninsula (Hume *12*, Kelham *14*); China (Swinh. *d 1*, *17*, David *8*); Japan (Whitely *II*, *a 13*); Formosa (Swinhoe *17*, *d 1*); Hainan (Styan *a 20*); Philippines (Cuming *17*, Everett *13bis*, etc.); Borneo (Diard, etc., *a 3*, *38*); Sumatra (S. Müller *a 3*, Horner *a 3*); Nias (Modigliani *28*); Java (Kuhl & v. Hasselt *a 3*); Sumba (ten Kate *a 17*); Flores (Wallace *17*); Timor (Wallace *17*, ten Kate *a 16*); Celebes — Gorontalo Distr. (Meyer *e 1*, Riedel *27*), Minahassa (Guillemard *23*, etc.), Macassar and Goa (Weber *a 19*); Sangi Islands — Gt. Sangi (Bruijn *6*), Siao (Nat. Coll. in Dresd. Mus.); Talaut Is. — Kabruang (iid. ib.); Peling (iid. *55*); Moluccas — Morty, Halmahera, Ternate, Batchian, Buru, Ceram, Amboina (Salvadori *17*, *44*); Papuasia — Timorlaut, Waigiou, ?Mysol, Salawatti, New Guinea, Aru (Salvadori *17*, *44*); Northern Australia (Ramsay *34*); Pelew Is. (Semper *45*); Carolines — Kushai (Lesson *45*).

The present species as regards its geographical range may be compared with the Eastern Golden Plover, *Charadrius fulvus*, except that it occurs neither so far north nor south, not being recorded as yet from Siberia or Mongolia by Taczanowski and Prjevalsky, nor from S. Australia, Tasmania or N. Zealand. Like *Charadrius fulvus*, it has straggled to Europe, a specimen being recorded by Giglioli from Italy, though Temminck's supposed Russian example remains doubtful *(25)*. Like *C. fulvus* also, the main body of individuals are migratory, but many remain in the tropics throughout the year, and the breeding of this species in Madagascar *(15)* may be compared with the breeding of *C. fulvus* in New Caledonia and New Zealand. In Celebes the bird appears to be present all the year, for Meyer obtained it at Limbotto in July; but this example is in winter plumage. In Malacca it is found in great numbers, according to Kelham, during the N. E. monsoon (winter). In Palawan Whitehead observed it arriving in flocks about the middle of August and speaks of it as the commonest winter visitor to Labuan, where it remains "late enough to attain its full summer plumage". According to Mr. De La Touche, it passes through South China on migration; where these individuals breed remains to be discovered. As has been made evident by Seebohm and Harting, it was the

eggs of this species which Swinhoe obtained in Formosa, but its chief breeding grounds are probably on the mainland further north.

In coloration both in summer and winter *A. geoffroyi* is extremely like *A. mongola* which occurs in many localities, including Celebes, with it; the former may, however, be recognised by its larger size and much larger and stronger bill (from forehead 23 mm, as against 18 mm in *mongola*).

320. AEGIALITIS MONGOLA (Pall.).

Lesser Shore Plover.

a. **Charadrius mongolus** *(1)* Pallas, Reise 1766, III, 700.

b. **Charadrius mongolicus** *(1)* Pallas, Zoogr. Rosso-As. 1811, 136; *(II)* Midd., Sibir. Reise 1853, II (1), 211, t. XIX, fig. 2, 3; *(3)* Schl., Mus. P.-B., Cursores, 1865, 41; *(IV)* Heugl., Vög. N. O. Afr. 1871, 1023, t. XXIV, f. 4; *(5)* id., J. f. O. 1874, 53; *(6)* Palm., ib. 1876, 43; *(7)* Rosenb., Malay. Archip. 1878, 278; *(8)* Severtz., Ibis 1883, 72; *(9)* Seeb., Distr. Charadr. 1887, 147; *(10)* Rchw., J. f. O. 1889, 265; *(11)* Seeb., B. Japan 1890, 308; *(12)* Styan, Ibis 1891, 503; *(13)* Campb., Ibis 1892, 246; *(14)* Styan, Ibis 1893, 436.

c. **Charadrius pyrrhothorax** "Temm." *(I)* Gld., B. Europe 1837, IV, pl. 299; *(2)* J. H. Blas. in Naum., Vög. Deutschl. 1860, XIII (2), 228.

d. **Charadrius crassirostris** *(1)* S. Müll. (nec Spix), Verh. Natuurk. Comm. 1839—43, 90.

e. **Charadrius ruficollis** *(1)* S. Müll. op. cit. in Index, 470; *(2)* id., Reize Ind. Archip. 1858, II, 12.

f. **Hiaticula inornata** part. *(I)* Gld., B. Austr. 1848, VI, pl. 19 (lesser figure).

g. **Aegialitis mongolica** (or **mongolicus**) *(1)* Swinh., Ibis 1870, 360; *(2)* Harting., t. c. 384; *(3)* Hume, Str. F. 1873, I, 17, 309; *(4)* Salvad., Cat. Ucc. Borneo 1874, 316; *(5)* Armstr., Str. F. 1876, IV, 339; *(6)* Hume, t. c. 293, 444, 463; *(7)* David & Oust., Ois. Chine 1877, 427; *(8)* Seeb., Ibis 1879, 25; *(9)* Vidal, Str. F. 1879, VIII, 172; *(10)* Legge, B. Ceylon 1880, 943; *(11)* Wardl. Rams., Tweedd. Orn. Works, Index 1881, 659; *(11bis)* Nelson, Cruise "Corwin" 1881, 85; *(12)* Salvad., Orn. Pap. III, 1882, 299; *(13)* Kelh., Ibis 1882, 10; *(14)* Oates, B. Br. Burmah 1883, II, 368; *(15)* W. Blas., J. f. O. 1883, 127; *(16)* Baird, Brew. & Ridgw., Water B. N. Am. 1884, I, 167; *(17)* Nehrk., J. f. O. 1885, 35; *(18)* Mats. & Ziem., t. c. 188; *(19)* Guillem., P. Z. S. 1885, 664; *(20)* Sharpe, Ibis 1886, 167; *(21)* W. Blas., Z. ges. Orn. 1886, 148; *(22)* Shell., Ibis 1888, 305; *(23)* Hume, Str. F. XI, 1888, 314; *(24)* Rams., Tab. List 1888, 19; *(25)* Everett, J. Str. Br. R. A. S. 1889, 205; *(26)* Oates, ed. Hume's Nests and Eggs 1890, III, 337, note; *(27)* Sharpe, Yarkand Mission, Aves 1891, 137; *(28)* Salvad, Agg. Orn. Pap. 1891, 200; *(29)* De La Touche, Ibis 1892, 496; *(30)* Barnes, Ibis 1894, 169; *(31)* M. & Wg., Abh. Mus. Dresd. 1894, Nr. 4, p. 3; *(32)* Bns. & Worces., B. Menage Exp. 1894, 31; *(33)* Grant, Ibis 1896, 126; *(34)* Salvad., Boll. Mus. Torino 1896, XI, 250.

Aegialitis mongolus (or **mongola**) *(1)* Swinh., P. Z. S. 1870, 140; *(2)* Hume & Davis., Str. F. 1878, VI, 455; *(3)* Hume, ib. 1878, VII, 438; *(4)* id., ib. 1879, VIII, 69; *(5)* Vidal, ib. 1880, IX, 81; *(6)* Butler, t. c. 426; *(7)* Oates, ib. 1880, X, 237; *(8)* Stejn., Bull. U. S. Nat. Mus. 1885, Nr. 29, p. 105; *(9)* id., Pr. U. S. Nat. Mus. 1887, X, 126; *(10)* Tacz., P. Z. S. 1888, 456; *(11)* Sclat., Ibis 1889, 249; *(12)* Tristr., Cat. Coll. B. 1889, 19; *(13)* Tacz., Faun. Orn. Sib. Orient. 1893, II, 822.

h. **Cirrepidesmus mongolicus** *(1)* Hume, Str. F. 1873, I, 230; *(2)* id., ib. 1874, II, 289, 482; *(3)* Butler, ib. 1877, V, 232, 236; *(4)* Heine & Rchw., Nomencl. Mus. Hein. 1890, 336.

i. **Aegialitis mastersi** *(1)* Rams., Pr. L. Soc. N. S. W. 1876, I, 135; *(2)* id., Tab. List 1888, 19.

j. **Aegialitis pyrrhothorax** *(1)* W. Blas., Z. ges. Orn. 1886, 148; *(2)* Stejn., Pr. U. S. Nat. Mus. 1887, X, 126.

k. **Ochthodromus mongolus** *(1)* Sharpe, Cat. B. 1896, XXIV, 223, 740.

l. **? Ochthodromus pyrrhothorax** *(1)* Sharpe, Cat. B. 1896, XXIV, 226.

"Lorie mulut pende", Minahassa, Nat. Coll.

For further synonymy and references cf. Salvad. *g 12*, *g 28*; Sharpe *k 1*, *? l 1*.

Figures and descriptions. Midd. *b II*; Heuglin *b IV*; Gould *c I*, *f I* (winter); Seebohm *b 9* (head, woodcut); Stejneger *9* (heads, woodcut), *8*; Harting *g 2*; David & Oust., *g 7*; Legge *g 10*; Salvadori *g 12*; Oates *g 14*; Baird, Brewer & Ridgway *g 16*; Ramsay *i 1*; Taczanowski *13*; Sharpe *k 1*,

Adult in winter plumage. Similar to *A. geoffroyi* (see *supra*) in winter plumage; the brown on the breast apparently more extended, meeting (or almost meeting) so as to form a pectoral collar. Size slightly smaller; bill and tarsus much shorter (18 and 33 mm respectively, as against 23 and 38 mm). "Iris dark brown; bill dusky black; legs and feet greyish plumbeous" (Armstrong *5*).

Summer plumage. In summer also the two species correspond. "In summer the upper parts deepen in colour. A light rusty chestnut colour marks the upper forehead, runs round the crown, and forms a broad nuchal collar extending across the breast and colouring the greater part thereof. The white of the forehead is diminished in size and divided in its centre by a narrow black line; a black line runs across above the white over the eye to the ear-coverts, and another below the white above the bill to the eye, and under it over the ear-coverts. A little white occurs under the eye, and a little above it in the eyebrow, which is for the most part rufous" (Swinhoe *1*).

Sometimes, as Stejneger shows, the entire forehead of the male in summer is black; more usually a space of white of very variable width, divided by a black line is found on the anterior forehead.

Female in breeding plumage. "Differs from the male in having the rufous parts much paler. The black markings on the forehead are almost absent, and under the eyes and on the ear-coverts replaced by blackish" (Stejneger *8*).

Young in first plumage. "Resembles somewhat the adults. The brownish grey of the back is paler, and each feather narrowly edged with isabella color, with which also the lower parts are suffused; on the pectoral region a buffish tinge replaces the rufous collar, and the black markings are absent from the head, the cheeks and ear-coverts being slightly dusky; forehead between the bill and eyes whitish suffused with isabella color" (Stejneger *8*).

Measurements.

	Wing	Tail	Tarsus	Bill from forehead
a. (C 13532) ? imm., Main, Minahassa, 8. II. 94 (Nat. Coll.)	138	54	32	19
b. (C 13252) ad., Main, Minahassa, 4. II. 94 (Nat. Coll.)	135	52	34	18
c. (C 13254) ad., Main, Minahassa, 8. II. 94 (Nat. Coll.)	137	54	32.5	18

Remark. The remiges of these Celebesian specimens killed in February are in good condition, as if the moult had taken place not very long ago. They are somewhat larger than the examples measured by Dr. Stejneger and Prof. W. Blasius: 8 adults examined by the former had the wing 127—133 mm; but Taczanowski *(13)* records one of 140 mm.

Eggs. Bering Island, where a few nests were discovered by Dr. Stejneger, is the only spot from where eggs are as yet known. Dr. Stejneger *(8)* describes them as resembling those of *A. semipalmata*, but larger, somewhat deeper in ground colour, in two examples more olive, in the others more buff; the spots in general smaller, herein more like eggs of *A. hiaticula*. Two of the nests contained three eggs; size in 7 examples: 36—37.25 × 26.5—27.25 mm.

Nest. In a slight hollow in the ground between the stems of four *Angelica archangelica*, formed of the leaves and stems of this plant, and numerous seeds of the same (Stejneger *8* — nest from Toporkof Islet, Bering Is., 4th June, 1883).

Distribution. N. America — Alaska *(g 16, g 11bis, 13)*; Asia from East Siberia and Kamtschatka *(g 13)* west to Turkestan *(b 8, g 27)* and Palestine *(g 10)*, south to Oman *(g 20)* and Aden *(g 10, g 30)*; East Africa from Egypt *(b 5)* to the Somali coast *(b IV)*, Lamu *(g 22)* and Zanzibar *(b 10)*; India (Blyth *g 12*, Jerdon *g 10, g 12*; etc.); Ceylon (Legge *g 10*); Laccadive Is. (Hume *g 6*); Andamans (Tytler *g 12*, etc. *3*, *h 2*); Nicobars (Hume & Davis. *h 2*); Burmah (Oates *g 14*); Tenasserim (Davison *2*); Malay Peninsula (Kelham *g 13*, Hume *4*); China (Swinhoe *1*, David *g 7*, etc.); Japan (Blakiston, etc. *b 11*); Hainan (Swinhoe *g 10*); Philippines (Everett, etc. *g 11, g 32*); Borneo (Schwaner, etc. *g 25*); Sumatra (f. Salvadori *g 34*); Java (Horsfield *g 12*); Celebes — (Rosenberg *b 7*), Gorontalo Distr. (Riedel *g 21*), Minahassa (Nat. Coll.), Buton Id. (S. Müller *e 1, e 2*); Moluccas — Morty, Halmahera, Ceram (f. Salvadori *g 12*); Papuasia — Waigiou, Salawatti, New Guinea, Aru, Louisiades, Duke of York Id., Admiralty Is., Torres Str. Is. (f. Salvadori *g 12*); N. Australia (E. P. Ramsay *g 24, i 2*).

Count Salvadori *(g 12)* includes Madagascar in its range, but the species is not admitted by Hartlaub nor by Milne-Edwards & Grandidier.

The present species, always distinguishable by its much smaller bill and tarsus from its near ally, *A. geoffroyi*, has a range somewhat similar to that bird, but it is known to occur much further north in Asia. Severtzow observed it breeding in Turkestan, and Stoliczka also noticed it apparently breeding there, but its nest, like those of other *Aegialitis*-species, is most difficult to find, and Dr. Stejneger alone has as yet succeeded in finding the eggs, viz. in Bering Island, where the bird is very plentiful in summer. In autumn it migrates south, visiting Aden, as Barnes observed; Ceylon, according to Legge, in numbers in September and October; India; passing through China in spring and autumn, as shown by the remarks of David and De La Touche; and occurring as a winter visitor, rare apparently, in the East Indies. But, as in the case of *A. geoffroyi* and many other migrants, some individuals appear to remain in the tropics throughout the year; Salvadori records an example killed on an island in Torres Straits in May, and another from Halmahera in July, while Hume and Davison *(h 2)* show that many remain on the Andamans all the year round, and Butler noticed that this was the case at Kurrachee in regard to *A. mongola* and a number of other waders. But the opinion expressed by the latter observer (and it is also suggested by Baird, Brewer and Ridgway touching *Strepsilas interpres* in the words: "Do birds after they have become old, effete, or barren, prefer to stay in a warm climate?" — Water B. N. Am. I, 123)

that these are barren birds and birds of the previous year which do not breed the first season, is controverted, or at least shown to be only half true, by Mr. Hume's record *(g 6)* of specimens apparently just newly fledged from the Andamans, and by the known breeding of allied species, *A. geoffroyi*, *Char. fulvus* (see *supra*), in their southern quarters. The birds are certainly not all barren; why they do not go north to breed remains to be explained; perhaps they find it wiser to stay where they are, perhaps they do not know the way.

A. mongola is a species rarely met with in Celebes. S. Müller says he found it in Buton, and Rosenberg has its name in his list of Celebesian birds, but no confirmation of this occurred till W. Blasius *(g 15, g 21)* made known an example from Riedel in the Brunswick Museum. This record was unfortunately overlooked by us, and three specimens obtained by our native hunters at Main in the north of the Minahassa found mention *(g 31)* as new for Celebes. There are also two from Manado in the British Museum *(k 1)*, most likely from Meyer. They add confirmation to Prof. W. Blasius' Celebesian specimen, which did not bear a label, and so by itself seemed hardly complete proof of the locality.

A. pyrrhothorax (Temm.), which was believed by W. Blasius *(j 1)* to be a constant variety having all the forehead black or brown, a somewhat shorter wing and longer tarsus, is held by Dr. Stejneger *(j 2)* to be identical, since "the frontal and cervical marks are subject to an almost indefinite variation", and these variations are not correlated with the length of the wing and tarsus. Sharpe, however, separates it again *(l 1)*.

For the habits of this Plover cf. Stejneger *(8)* and Legge *(g 10)*.

321. AEGIALITIS CURONICA (Gm.).

Lesser Ringed Plover.

a. **Charadrius dubius**[1]**?** *(1)* Scop., Del. Flor. et Faun. Insubr. 1786, 93; *(2)* Hartert, Kat. Vog. Slg. Senckenb. Mus. 1891, 217.

b. **Charadrius curonicus** *(1)* Gm., S. N. 1788, I, 692 (ex Beseke).

c. **Charadrius philippinus** *(1)* Lath., Ind. Orn. 1790, II, 745; *(2)* Schl., Mus. P.-B., Cursores, 1865, 28; *(3)* Rosenb., Malay. Archip. 1878, 277; *(4)* Vorderm., N. T. Ned. Ind. 1882, XLII, 105.

d. **Charadrius minor** *(1)* Meyer & Wolf, Vög. Deutschl. 1805, I, 182; *(II)* Naum., Vög. Deutschl. 1834, VII, 225, t. 177; *(III)* Gld., B. Eur. 1837, IV, pl. 297; *(IV)* Seeb., Br. B. 1883, III, 16, pl. 26 (egg); *(5)* id., Distr. Charadr. 1887, 130; *(6)* id., B. Japan 1890, 306; *(7)* Styan, Ibis 1891, 503; *(8)* Campb., Ibis 1892, 246; *(9)* De La Touche, t. c. 496; *(10)* Büttik., Zool. Erg. Weber's Reise 1893, III, 282.

e. **Charadrius fluviatilis** *(1)* Bechst., Naturg. Deutschl. 1809, IV, 422.

f. **Aegialitis minor** *(1)* Boie, Isis 1822, 558; *(II)* Gld., B. Gt. Brit. 1871, IV, pl. 42; *(3)* Tacz., Faun. Orn. Sib. Orient. 1893, II, 830.

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[1]) For reasons why it is undesirable to make use of this name, see Legge *(5)*. It might belong to *curonica*, or *jerdoni*, or some other species; the description of course suits neither of the former exactly. Several authors enumerate specimens of *dubius* and *curonica* as if they were distinct species. Do they mean *jerdoni* by the former name, or what?

Aegialitis curonica (or **curonicus**) *(1)* Keys. & Blas., Wirbelth. Eur. 1840, 71; *(II)* Dresser, B. Europe VII, 491, pl. 524 (1876); *(3)* Prjev., Rowl. Orn. Misc. 1877, II, 435; *(4)* Hume & Davis., Str. F. 1878, VI, 456, 521; *(5)* Legge, B. Ceylon 1880, 952; *(6)* Bolau, J. f. O. 1880, 131; *(7)* Salvad., Orn. Pap. 1882, III, 304; *(8)* Baird, Brew. & Ridgw., Water B. N. Am. 1884, I, 159; *(9)* Dedit., J. f. O. 1886, 527; *(10)* Radde & Walter, Ornis 1889, 107; *(11)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 17; *(12)* iid., ib. 1896, Nr. 1, p. 6.

g. **Aegialitis dubia** *(1)* Wald., Tr. Z. S. 1872, VIII, 89; *(2)* David & Oust., Ois. Chine 1877, 429; *(3)* Hume, Str. F. 1878, VII, 227; *(4)* id., ib. 1879, VIII, 69; *(4bis)* Wardl. Rams., Tweedd. Orn. Works 1881, 659, Nr. 309; *(5)* Kelham, Ibis 1882, 10; *(6)* Oates, B. Brit. Burmah 1883, II, 370; *(7)* Sharpe, Ibis 1888, 203; *(8)* W. Blas., Ornis 1888, 319; *(VIIIbis)* Meyer, Vogelskel. 1886, I, pl. CVIII; *(9)* Everett, J. Str. Br. R. A. S. 1889, 205; *(10)* Whitehd., Ibis 1890, 58; *(11)* Sh., t. c. 142, 284; *(12)* Oates, ed. Hume's Nests and Eggs 1890, III, 338; *(13)* Steere, List Coll. B. & M. Philipp. 1890, 25; *(14)* Bns. & Worces., B. Menage Exp. 1894, 31; *(15)* Everett, Ibis 1895, 34; *(16)* Grant, t. c. 266, 472; *(17)* Sharpe, Cat. B. 1896, XXIV, 263, 744; *(18)* Hart., Nov. Zool. 1896, 590.

h. **Charadrius philippinensis** *(1)* Rosenb., Zool. Garten 1881, 167.

i. **? Aegialitis peroni** *(1)* Vorderm., N. T. Ned. Ind. 1892, LI, 409.

For further synonymy cf. Dresser *II*; Seebohm *d 5*; Sharpe *g 17*.

Figures and descriptions. Naumann *d II*; Gould *d III*, *f II*; Dresser *II*; Meyer *g VIIIbis* (skel.); Seebohm *d 5* (woodcut); Vorderman *c 4*; Taczan. *f 3*; Legge *5*; Baird, Brew. & Ridgw. *8*; Oates *g 6*; Sharpe *g 17*.

Adult in winter. Above drab-brown, with paler edgings to the feathers, forehead paling into buff-white; lores blackish, this colour passing under the eye on to the ear-coverts; cheeks, chin, throat and nuchal collar white, bounded below by a blackish collar round neck, tinged with pale brown on jugulum; remaining under-parts white; primary coverts and outer primaries blackish, the first with the shaft white, the inner remiges browner, slightly tipped with white; middle tail-feathers drab, the terminal 20 mm blackish, all the lateral tail-feathers broadly tipped with white, increasing towards the outermost, which are white with a cross-mark of black on the inner web; "iris dark brown; bill black, yellow in some at the base of the under mandible; eyelid yellowish; legs and feet dusky yellow; joints and tips of toes greenish brown": Legge *5* (♂, Tondano, 17. Nov. 1894: P. & F. Sarasin).

Young in first plumage. Very like the adult described; the blackish wanting on the ear-coverts, less pronounced on the lores; the dark collar smaller, pale brown on the jugulum, dusky on sides thereof; the feathers of the upper parts more conspicuously margined with pale brown (♂, Kema, 26. Oct. 93: P. & F. Sarasin).

Adult in breeding plumage. Has the collar jet-black, passing narrowly across the hind-neck, broadly across the jugulum and sides of breast; a patch of black covering lores, subocular region (except for a narrow white mark just below the eyelid) and ear-coverts; a broad bar of black across crown from eye to eye; forehead white, except just at base of bill (♂ ad., Dresden: Schwarze — Nr. 14150).

Measurements.	Wing	Tail	Tarsus	Bill from forehead
a. (Sarasin Coll.) ♂ juv., Kema, 26. Oct. 93	115	58	25.5	13
b. (Sarasin Coll.) ♂ Kema, 20. Oct. 93	115	58	26	13
c. (Sarasin Coll.) ♂ Tondano, 17. Sept. 94	116	62	27	12.5

Eggs. 4; pyriform; pale buff, speckled and streaked with surface spots of dark and light brown, with underlying markings of inky grey; size 29—30.5 × 21.6—22.9 mm (from Seebohm *d 4*).

Nest. None; the bird "scratching a little hollow in the sand or shingle, which it treads into a very neat, round, shallow basin" (Seebohm *d 4*).

Distribution. Europe; Africa down to the Gaboon and Mozambique; Asia; ? N. America (Alaska and coast of California); Philippines and Great Sunda Islands (see Dresser *II*, Legge *5*, Taczanowski *f 3*, Sharpe *g 17*); India (Jerdon, etc. *5*); Ceylon (Legge *5*); Burmah (Oates *g 6*); Tenasserim (Hume & Davison *4*; Malay Peninsula (Hume *g 4*, Kelham *g 5*); China (David *g 2*, etc.); Corea (Campb. *d 8*); Japan (Blakiston, Pryer *d 6*); Formosa (Swinhoe *c 2*); Philippines — Luzon, Leyte, Bohol, Negros, Guimaras, Catanduanes, Mindanao, Palawan (Everett *g 4bis*, Steere *g 13*, Bourns & Worces. *g 14*, Whitehead *g 7*, *g 16*, etc.); Borneo (S. Müller Mottley, etc. *g 9*); Java (Kuhl & v. Hasselt *c 2*, Boie *c 2*); Sumba (Doherty *g 18*); Celebes — Gorontalo Dist. (v. Rosenb. *c 2*), Minahassa (P. & F. Sarasin), Macassar (Weber *d 10*).

In the eastern parts of Asia the Little Ringed Plover, according to Taczanowski, has not yet been found in Kamtschatka, and the limits of its northern range in E. Siberia are not yet known. Prjevalsky observed it breeding in Mongolia, and Taczanowski describes eggs from Dauria, and Nikolski affirms that it breeds in Sakhalien Island. In these territories it is only a summer visitor. Godlewski remarks that it arrives in Dauria at the beginning of May and leaves at the end of September; in Mongolia Prjevalsky *(3)* observed its first appearance on 9th April. Throughout China it is, according to David, extremely abundant, even in winter. As to its residence in winter, this remark probably has more strict reference to South China, for Styan *(d 7)* describes it as common in the Lower Yangtse basin during migration in March, April and May, and again in September and October. In Southern China Mr. De La Touche *(d 9)* observed it passing Foochow from the beginning of March to the beginning of May; it winters in Swatow. The southern migration seems to pass on across the China Sea, but in diminished numbers; in North Borneo Whitehead *(g 11)* speaks of it as "a winter visitor, generally seen singly or in pairs on the sea-coast"; in Palawan he first observed it on 30th July. From Celebes we are able to point only to 6 specimens: one in the Leyden Museum killed by Rosenberg at Lake Limbotto, 6th August, 1863; three obtained by the Drs. Sarasin late in the year in the Minahassa, as shown above; two in Prof. Weber's collection from Macassar.

The Little Ringed Plover has very close affinities with *A. jerdoni*, a species which seems to have often been confused with it in India, and about which there is still much obscurity. In India *A. jerdoni* has been reported as a permanent resident (Hume N. & Eggs Ind. B. 1890, III, 340), but *A. curonica* is recorded as a breeding species there as well (perhaps through mistaken identity?). Legge believed that he discovered the eggs of *A. jerdoni* in Ceylon, but only knew *A. curonica* as a winter visitor there. Salvadori records *A. jerdoni*

further from New Guinea and New Ireland, and questions Schlegel's determination of the specimens of *A. curonica* from Java, Borneo, and Celebes in the Leyden Museum, suggesting that they may be *jerdoni*. Since *A. jerdoni* occurs in New Guinea as well as India, it is of course almost certain that it will be found in the intermediate countries, either as a migrant or a resident; at present, however, we know of no satisfactory proof of this. The Sarasins' specimens from Celebes show themselves by their large size and by their bills to be *A. curonica*, most likely wanderers from the north, and Schlegel's specimens are probably the same. *A. jerdoni* is described by Legge as having the wing 99—108, tail 51—56, tarsus 24—25.4 mm, and without or with a very small amount of black extending from the lores across the base of the forchead, with more yellow on the bill, the basal half of the lower mandible and a spot at the base of the culmen being yellow, and with a remarkably protuberant and corrugated fleshy orbital circle.

It appears possible that *A. jerdoni* has arisen from *A. curonica* from individuals which have settled in the winter quarters, like as *Charadrius fulvus* and *Aegialitis geoffroyi* seem to have done in one or two spots.

The Little Ringed Plover may be looked for on the strand of fresh water lakes and of rivers, especially as Naumann says, those which have not a muddy bed; among other places it is plentiful along the Elbe near Dresden, where it breeds, leaving for the winter. Its note is a plaintive pipe or whistle, rather like that of a young chicken, and well expressed by Naumann as "diä", both vowels uttered shortly and almost in one tone.

322. AEGIALITIS PERONI (Schl.).

Malay Shore Plover.

a. **Charadrius peroni** [Temm. in Leyden Mus.], *(1)* Bp., Compt. Rend. 1856, XLIII, 417, Nr. 68 (descript. nulla); *(2)* Schl., Mus. P.-B., Cursores, 1865, 33; *(3)* Gray, HL. 1871, III, 16, Nr. 10005; *(4)* Brügg., Abh. Ver. Bremen 1876, V, 89; *(5)* Rosenb., Malay. Archip. 1878, 277; *(6)* Seeb., Distr. Charadr. 1887, 166.

b. **Charadrius alexandrinus** *(1)* Mottl. & Dillw. (nec Hasselq.), Contr. Nat. Hist. Lab. 1855, 47 (fide Salvad.).

c. **Charadrius philippinus** *(1)* Pelz. (nec Lath.), Novara Reise, Vög. 1865, 116, 162.

d. **Aegialites perronii** *(1)* Swinh., P. Z. S. 1870, 139.

Aegialitis peroni *(1)* Wald., Tr. Z. S. 1872, VIII, 90, pl. X, fig. 2; *(2)* Salvad., Cat. Ucc. Borneo 1874, 315; *(3)* Tweedd., P. Z. S. 1878, 344, 711; *(4)* Meyer, Ibis 1879, 141; *(5)* Hume, Str. F. 1879, VIII, 200, 201; *(6)* Legge, B. Ceylon 1880, 948; *(7)* Sharpe, Ibis 1884, 322; *(8)* Guillem., P. Z. S. 1885, 417; *(9)* Sharpe, Ibis 1888, 203; *(10)* W. Blas., Ornis 1888, 319; *(11)* Everett, J. Str. Br. R. A. S. 1889, 205; *(12)* Whitehead, Ibis 1890, 58; *(13)* Sh. & Whitehead, t. c. 142; *(14)* Steere, List B. & M. Philipp. 1890, 25; *(15)* Heine & Rchw., Nomencl. Mus. Hein. 1890, 336; *(16)* Sharpe, Ibis 1894, 243, 258; ? *(17)* Vorderm.[1]), N. T. Ned. Ind. 1895,

[1]) A specimen recently described by Dr. Vorderman (N. T. Ned. Ind. 1892, LI, 409) from Java as *A. peroni* shows itself by its long wing (116 mm) to be some other species — perhaps *curonica*, since the shaft of the first primary only is white and the tail measures 55 mm.

LIV, 351; *(18)* Grant, Ibis 1896, 126; *(19)* Sharpe, Cat. B. 1896, XXIV, 273, 745; *(20)* Hart., Nov. Zool. 1896, 598.

Figures and descriptions. Walden *I*; Seebohm *a 6* (head); Hume *5*; Schlegel *a 2*; Swinhoe *d 1*; Sharpe *19*.

Adult. Forehead and superciliary region white; a bar across the fore crown, lores and ear-coverts black; rest of head above and nape brown-rufous; chin, cheeks, throat, a narrow collar round hind-neck, and entire under-parts white; a cervical collar, nearly (sometimes quite) meeting on jugulum, black, duskier above mantle; remaining upper-parts drab-brown with pale tips, the greater wing- and primary-coverts broadly tipped with white, the others less conspicuously; remiges dark brown, the shafts white, all, except the external primaries, tipped with white, and the five inner primaries white on the outer webs, except towards tip; tail dark brown, the three outermost feathers pure white: legs pale (Banjermassing, Borneo: v. Schierbrand — C 12402).

Female. Without the black frontal band, the black on mantle, hind-neck, and sides of neck replaced by brown (Sharpe *19*).

Young. Differs from the adult in wanting the black markings on the head and in having the cervical collar brownish rufous, not black (Banjermassing: v. Schierbrand — C 12403).

A second and younger specimen from Timor (Riedel — C 6261) has the inner quills more broadly tipped with white than in the adult bird, the upper parts broadly bordered with very pale brown (wood-brown), the least wing-coverts with whitish tips, the other wing-coverts more conspicuously edged and tipped with white.

Measurements.	Wing	Tail	Tarsus	Bill from forehead
a. (C 3529) ad., Minahassa (v. Faber)	100	40	29.5	15.5
b. (C 12402) ad., S. Borneo (v. Schierbrand)	99	45	29.5	15.5
c. (C 12403) imm., S. Borneo (v. Schierbrand)	97	43	27.5	13.5
d. (C 6261) juv., Koepang, Timor (Riedel).	94	41	27.5	13.5

Eggs. 3; "of a buff colour, thickly blotched with sepia at the larger end, speckled and marked to a lesser degree all over with the same colour and lighter grey; sometimes they are speckled and streaked all over without any blotches at the large end; size 33 × 24 mm" (Whitehead *12*).

Nest. None. On the sand-spits and bays round the coast of North Borneo. The eggs are placed in the full glare of the burning sun amongst the sea-drift (Whitehead *12*).

Distribution. Java (Kuhl & v. Hasselt *a 2*, Vriese *a 2*); Borneo (S. Müller, etc. *a 2*, *11*); Labuan, Tega and Mengalan Is. (Everett *19*); Philippines — Leyte and Bohol (Everett *3*), Negros, Siquijor and Mindanao (Steere *14*), Sooloo — Sibutu (Everett *16*); N. Celebes — Minahassa (Wallace *19*, Fischer *a 4*, Faber), Gorontalo Distr. (Meyer *4*), Macassar (Wallace *I*); Lombok (Vorderman *17*, Everett *20*); Timor (Riedel in Dresden Mus.); Semao (S. Müller *a 2*).

Mr. Whitehead remarks that the present species is a resident in Borneo and Palawan. There can be little doubt that such it is also in the other East India Islands in which it occurs. From its characters it may be termed a slight modification of *A. cantiana* of Europe and Asia, or rather of the *cantiana*-group of Plovers, consisting of the typical form, *dealbata* of China and Formosa, *minuta* Seeb. (not of Pallas) of the coast of the Red Sea and Ceylon, *nivosa* of North

America, *collaris* of S. America, and *ruficapilla* of Australia, New Guinea and New Zealand. It would be a matter for no great surprise if three of these closely allied forms were to be found in Celebes besides *Aegialitis peroni;* namely *A. cantiana* and *dealbata* as winter visitors, and *A. ruficapilla* as a straggler from Australia or New Guinea. *A. cantiana*, which is already known from Borneo and some of the Philippines, may be recognised by its black (or leaden) legs and larger size (wing 104—114 mm: Seebohm); *A. dealbata* has light yellowish brown or flesh-coloured legs like *peroni*, but is fully as large as *cantiana* and, as in that bird, the black collar (or rather the remains of it) is found only on the sides of the neck, not on the hind-neck; *A. ruficapilla* is of about the same size as *A. peroni*, but, as Seebohm remarks, it has neither the black nor the white nuchal collar; the tarsi are light grey, feet blackish brown. An example in the Dresden Museum (Nr. 11440) with the wing 114 mm, labelled "Philippines", seems to be *dealbata.*

Compared with *A. curonica* and its closest allies, the *cantiana*-group differs in having a relatively longer tarsus, shorter tail (shorter by about $^1/_6$) and much longer and stouter bill; the three outer tail-feathers are pure white, the shafts of all the remiges are white (except at the tip), and the head of the adult is rufous behind the black bar of the fore crown.

A recent writer on migration asserts that northern birds do not increase their breeding range towards the tropics. Swinhoe *(d 1)* remarks of *A. dealbata* of China, Hainan and Formosa, that no one can doubt the fact of its being derived from *A. cantiana.* In the same way it might be urged that *peroni* and the other forms of the south were sprung from that species, in other words, that *A. cantiana* has spread its breeding range southward, where it has undergone local modifications. On the other hand it may be supposed that one of the tropical races gave rise to the northern *cantiana.* The former view seems the more plausible one, because, as has been shown, certain allied migratory species stay the summer in their winter quarters, and cases are known of their breeding there[1]). As to the modifications of *A. peroni*, Seebohm remarks that "its small size is probably connected with the fact that it lives upon islands and not upon a continent", and believes that, being of a somewhat arctic genus, it has decreased in size in the uncongenial climate of the tropics. If *peroni* is really sprung from *cantiana*, it has of course decreased in size (supposing *cantiana* has not since grown larger), but more proof of a decrease in size of northern forms in the tropics is desirable, for as a rule a more luxuriant growth pertains to the tropics, and it does not appear that islands are likely to harbour smaller forms than continents (except, perhaps, among the *Raptores*); the small Sangi Islands at all events produce larger races than the large island of Celebes.

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[1]) *Charadrius fulvus, Aegialitis geoffroyi, Aeg. mongola, Strepsilas interpres* and *Limosa novaezealandiae.*

GENUS STREPSILAS III.

The Turnstone is about the size of a Thrush, has the bill about as long as the cranium, very slightly recurved, no dertrum or swollen tip, the maxillary groove not carried on to the terminal third; legs rather short, tarsus equal to middle toe and claw in length, anteriorly transversely scutellated; a small hallux present; toes cleft to the base, the soles broadened; wing long, the first large quill the longest, the middle secondaries less than half its length.

The absence of a dertrum, the short tarsus, and the toes with no basal web serve to distinguish it from the Plovers, the short nasal groove from other Celebesian *Limicolae*, the short legs, etc. from *Himantopus*. Almost cosmopolitan.

323. STREPSILAS INTERPRES (L.).

Common Turnstone.

Strepsilas interpres (Linn.); *(1)* Illiger, Prodr. 1811, 263; *(II)* Naum., Vög. Deutschl. VII, 303, t. 180 (1834); *(III)* Gld., B. Gt. Brit. IV, pl. 60, (1870); *(IV)* id., B. Austr. 1848, VI, pl. 39; *(5)* id., Hb. B. Austr. 1865, II, 269; *(6)* Schl., Mus. P.-B., Cursores, 1865, 43; *(7)* Finsch, Neu Guinea 1865, 181; *(8)* Finsch & Hartl., Orn. Centralpol. 1867, 197; *(9)* Wald., Tr. Z. S. 1872, VIII, 91; *(10)* Salvad., Cat. Ucc. Borneo 1874, 320; *(XI)* Dresser, B. Europe VII, 555, pl. 532 (1875); *(12)* David & Oust., Ois. Chine 1877, 433; *(13)* Oust., Bull. Soc. Philom. 1878, 183; *(14)* Meyer, Ibis 1879, 141; *(15)* Milne-Ed. & Grandid., Ois. Madag. 1879, I, 512; *(16)* Finsch, Ibis 1880, 432; *(17)* Legge, B. Ceylon 1880, 900; *(18)* Meyer, Verh. z.-b. Ges. Wien 1881, 767; *(19)* Salvad., Orn. Pap. III, 1882, 289; *(20)* Oates, B. Brit. Burmah 1883, II, 376; *(21)* Baird, Brew. & Ridgw., Water B. N. Am. I, 1884, 119; *(22)* Seeb., Distr. Charadr. 1887, 410; *(23)* Rams., Tab. List 1888, 20; *(24)* W. Blas., Ornis 1888, 319; *(25)* Buller, B. N. Zeal. 2nd ed. 1888, II, 14; *(26)* Seeb., B. Japan. Emp. 1890, 331; *(27)* Whitehd., Ibis 1890, 59; *(28)* Steere, List Philipp. 1890, 26; *(29)* Salvad., Orn. Pap. Agg. 1891, 198; *(30)* Styan, Ibis 1891, 504; *(31)* Wiglesworth, Av. Polyn. 1892, 63; *(32)* De La Touche, Ibis 1892, 497; *(33)* Taczan., Faun. Orn. Sib. Or. 1893, II, 845; *(34)* Bourns & Worces., B. and M. Menage Exp. Philipp. 1894, 31; *(35)* Pearson & Bidw., Ibis 1894, 234; *(36)* Everett, Ibis 1895, 34, 39; *(37)* Grant, Ibis 1896, 126; *(38)* Hart., Nov. Zool. 1896, 180.

a. **Strepsilas collaris** (B. Meyer); *(1)* S. Müll., Verh. Natuurk. Comm. 1839—44, 90, 110; *(2)* id., Reizen Ind. Archip. 1858, pt. II, 13.

b. **Charadrius interpres** *(1)* Seeb., Brit. B. 1885, III, 12.

c. **Tringa interpres** L.; *(1)* Gätke, Vogelwarte Helg. 1891, 524.

d. **Arenaria interpres** *(1)* Sharpe, Cat. B. 1896, XXIV, 92, 728.

"Lorie burik", Banka Id., Minahassa, Nat. Coll.

For further synonymy and references cf. Naumann *II*; Finsch & Hartl. *8*; Salvadori *10, 19*; Dresser *XI*; Milne-Ed. & Grandid. *15*; Legge *17*; Baird, Brewer & Ridgw. *21*; Seebohm *22*; Sharpe *d 1*; etc.

Figures and descriptions. Naumann *II*; Gould *III, IV*; Dresser *XI*; Seebohm *22*; Finsch & Hartl. *8*; Legge *17*; Taczanowski *33*; Sharpe *d 1*; etc.

Old male in breeding plumage. Head above, sides of occiput, hind neck, and cervical collar white, with black centre-streaks on crown and occiput; breast black, passing on to the shoulders and sides of neck; a branch from the latter bifurcating on the cheek into a broad submalar and subocular streak, the latter turning at the front of the eye narrowly to the forehead, enclosing a quadrangular white patch; chin and throat white; mantle and wings light hazel, mixed with black; greater and lesser wing-coverts drab, the latter tipped with white; primaries greyish black, shafts white; back, rump, and under-parts white; longer upper tail-coverts and tail white, the shorter ones and a broad terminal bar on tail blackish; "bill blackish; iris dark brown; legs orange-red": Dresser *XI* ([♂] ad. Canada: Dr. Ross — Nr. 2720).

Probably specimens in this plumage are not to be found in Celebes.

Breeding female. It is much like the male, but less brilliantly particoloured.

Adult in winter. Has less chestnut in the plumage; the black portions of the head, neck and breast obscured by white tips to the feathers, and intermixed with white feathers (from Dresser *XI*).

Young in winter. Head, neck, mantle, scapulars and wing-coverts dark brown with paler margins, greyer brown towards the head, greater wing-coverts broadly tipped with white; back, longer upper tail-coverts, base and tip of tail, and under-parts white, shorter under tail-coverts and rest of tail blackish; upper breast blackish, with pale tips to the feathers, continuing on to the sides of neck and cheeks; throat white (Gorontalo Distr.: Riedel — C 14129).

Celebesian examples seen by us are young in this type of plumage.

Half-grown chick. Much like the above in coloration; the wings and scapulars broadly bordered with tawny (Sweden, July — Nr. 12462).

Measurements (adult). Circa: wing 153 mm; tail 64; tarsus 25; middle toe 25; bill from forehead 22.

Eggs. 4. "Differing considerably from those of the typical Plovers, and approaching much more closely those of the Sandpipers . . . pale olive-green of different shades to pale buff in ground-colour, dashed, clouded, spotted, and blotched with olive-brown and very dark brown and with underlying markings of purplish grey"; size 38.6—43.2 × 28—30.5 mm (from Seebohm *b 1*).

Nest. "A few bits of dry herbage or withered leaves, scratched into a little hollow, which is usually selected under a tuft of herbage, or under a broad-leaved plant, or behind a bush" (Seebohm *b 1*).

Distribution. Europe; Africa; Asia; Australia; Polynesia; America. For the East Indian and Papuan Islands (cf. Salvad. *19*, *29*); Australia and Tasmania (E. P. Ramsay *23*); Polynesia (Wiglesw. *31*); New Zealand (Buller *25*). In the Celebes Province: — Minahassa (Meyer *14*), Banka (Nat. Coll.), Gorontalo (Riedel in Dresden Mus.), Buton (S. Müller *a 1*), Saleyer (Everett *38*).

The Turnstone has been met with in many places on the sea-coast from Spitzbergen to the Cape, from the Arctic shores of Siberia to Tasmania and New Zealand, from $82^1/_2°$ N. in Greenland to Chili. It is known as a breeding species in the higher northern latitudes and, generally, as a bird of passage in, or winter visitor to, the more temperate intermediate, tropical, and southern localities; yet there seem to be many exceptions to this. Dresser repeats Layard's opinion that it breeds on Robben Island, South-west Africa,

Du Cane Godman's belief that it breeds in the Azores, and Bolle's statement that it is a permanent resident in the Canaries; Mr. N. B. Moore *(21)* found that many remain all through the year on the coast of Florida; Dr. Finsch held this to be the case in the Marshall and Gilbert atolls. It seems clear that its migration is not quite thorough-going and complete; birds often remain behind in their winter quarters, and this, probably, is more generally the rule with migrant birds than is at present supposed. In Celebes, where few specimens have been obtained, the Turnstone probably occurs as a bird of passage. A specimen from Banka obtained by our native collectors is dated as late as 15th May.

GENUS HIMANTOPUS Briss.

The Stilt is easily distinguishable from the other Waders occurring in Celebes by the great length of the tarsus, which is longer than the tail and about 3 times as long as the middle toe; no hallux; bill slender, straight or slightly recurved, about twice as long as the head, without a dertrum, nasal groove in the basal half, nostril in the basal fourth; wing long and pointed, the outermost large quill the longest. General colours black and white. Dr. Sharpe recognises 6 species, occurring in the temperate and tropical regions of the world.

324. HIMANTOPUS LEUCOCEPHALUS J. Gd.

White-headed Stilt.

Himantopus leucocephalus *(1)* Gould, P. Z. S. 1837, 26; *(II)* id., B. Austr. 1848, VI, pl. 24; *(3)* Schl., Mus. P.-B., Scolopaces, 1864, 106; *(4)* Blyth, Ibis 1865, 35; *(5)* Gould, Hb. B. Austr. 1865, II, 246; *(6)* Wald., Tr. Z. S. 1872, VIII, 91; *(7)* id., ib. 1875, IX, 228; *(8)* Rosenb., Malay. Archip. 1878, 278; *(9)* Meyer, Ibis 1879, 141; *(10)* Legge, B. Ceylon 1880, 921; *(11)* Wardl. Rams., Tweedd. Orn. Works Index 1881, 654, 659; *(12)* Rosenb., Zool. Garten 1881, 167; *(13)* Salvad., Orn. Pap. 1882, III, 309; *(14)* W. Blas., J. f. O. 1883, 139; *(15)* id., ib. 1884, 218; *(16)* Vorderm., N. T. Ned. Ind. 1885, XLIV, 204; *(17)* Guillem., P. Z. S. 1885, 559; *(18)* id., Cruise "Marchesa" 1886, II, 208; *(19)* W. Blas., Z. ges. Orn. 1886, 163; *(20)* Rams., Pr. L. Soc. N. S. W. 1886, (2) I, 1099; *(21)* Seeb., Ibis 1886, 225, 233; *(22)* id., Distr. Charadr. 1887, 283; *(23)* Rams., Tab. List 1888, 20; *(XXIV)* Bull., B. N. Zeal. 2nd ed. 1888, II, 21, pl. XXVII; *(25)* Everett, J. Str. Br. R. A. S. 1889, 206; *(26)* North, Nests & Eggs B. Austr. 1889, 310; *(27)* Studer, Reise "Gazelle" 1889, III, 219; *(28)* Steere, List Coll. Birds & M. Philipp. Is. 1890, 25; *(29)* Salvad., Orn. Pap. Agg. 1891, 201; *(30)* Mc Lean, Ibis 1892, 252; *(31)* Ribbe, Jb. Ver. Erdk. Dresden 1892, 173; *(32)* Büttik., Notes Leyd. Mus. 1892, XIV, 206; *(33)* id., Zool. Erg. Weber's Reise 1893, III, 283; *(34)* Madar., Aquila 1894, 105; *(35)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 15; *(36)* Hart., Nov. Zool. 1896, 180; *(37)* Sharpe, Cat. B. 1896, XXIV, 317, 751.

a. **Himantopus** *(1)* Reinw., Reis Ind. Archip. 1858, 592.

"Lilimo" Rosenb. *8*, or **"Lilimu"** Joest, Das Holontalo 1883, 105; Gorontalo Distr.

For further synonymy and references cf. Salvadori *13*, *29*; Sharpe *37*.

Figures and descriptions. Gould *II*, *5*; Buller *XXIV*; Seebohm *22* (woodcut); Salv. *13*; Sharpe *37*.

Adult. Entire head and nape, a collar above the mantle, lower back, rump, upper tail-coverts and tail, and entire under-parts white; hind-neck, mantle and wings (including under wing-coverts) black, glossed with green; "iris yellow; bill black; legs bright red": Guillem. *17* (N. Celebes: Faber — C 3566).

"Iris red" (♂, P. & F. Sarasin).

Sexes. According to Gould, the male is larger than the female.

Young of the first autumn. "Crown of the head and hind-neck dusky black, mottled with white; shoulders spotted with black darkening towards the back; upper part of back and scapulars brownish black; upper surface of wings glossy black; the median coverts as well as the feathers of the back narrowly tipped with brown; lower part of back and rump white; tail-feathers dull black, tipped with brown, their coverts (which are very fluffy) plumbeous at the base, white on their apical portion, and tipped with yellowish brown; lining of wings black, the rest of the plumage pure white; bill black, brownish towards the base; irides reddish yellow; legs pale yellow; the claws brown" (Buller *XXIV*).

A young specimen in the Dresden Museum differs from the adult in wanting the black hind neck, the entire neck being white like the under-parts, the crown and occiput smoke-grey, the mantle mottled with grey, the upper back brown (♀, Limbotto, July, 1871: Meyer — C 1989).

Other stages of plumage are described by Sir Walter Buller *(XXIV)*.

Measurements.

	Wing	Tail	Tarsus	Bill from forehead
a. (C 1988) ♂ ad., Limbotto, July, 71 (Meyer)	222	70	120	60
b. (C 3566) ad., N. Celebes (Faber)	223	75	118	61
c. (C 3565) ad., N. Celebes (Faber)	222	70	111	65
d. (C 5251) ad., Gorontalo, Jan. 76 (v. Mussch.) . . .	240	79	116	—
e. (C 1989) juv., Limbotto, July, 71 (Meyer)	194	64	98	54
f. (Sarasin Coll.) ♂ ad., Lake Posso, 21. II. 95 . . .	232	76	118	67
g. (Sarasin Coll.) ♀ ad., Lake Posso, 21. II. 95 . . .	224	75	97	63

Eggs. 4. "The East Indian eggs are clay-yellow, with numerous, sharply delineated, black and black-brown spots. The measurements are 40—41 × 32 mm" (Nehrkorn MS.). See, also, North *26*, Buller *XXIV*.

Nest. "A slight structure . . . a few short pieces of rush and grass, placed in and around a depression at the foot of a clump of rushes growing near the water's edge of a lagoon" (South Grafton, Australia: Ramsay *26*). Sometimes no nest is made (Buller *XXIV*).

Distribution. All Australia (Gould *II*, Ramsay *23*); New Zealand (Buller *XXIV*); New Guinea; Ferguson Id.; Mysol; Amboina; Ternate (cf. Schleg. *3*, Salvad. *13*, *29*); Ceram (Ribbe *31*); Celebes — Tondano (Reinw. *a 1*, Meyer *9*), Limbotto (Forsten *3*, v. Rosenb. *3*, etc.), Lake Tempe, S. Celebes (Weber *33*), Lake Posso (P. & F. S. *35*), Saleyer (Everett *36*); Timor (S. Müller *3*); Rotti (ten Kate *32*); Sumbawa (Forsten *3*); Java (S. Müller *3*, de Bocarmé *3*); Borneo (Schwaner *3*, *25*); Philippines — Mindanao (Cuming *7*, Steere *28*).

The White-headed Stilt is a breeding species in Celebes, as is shown by a young specimen in down in the Leyden Museum. It is a common bird on

Lake Limbotto, but has, apparently, been much more rarely obtained on the better known Lake of Tondano. In Australia Gould found it feeding on insects and small shelled snails; it runs with grace and celerity, but flies heavily, uttering a plaintive piping cry. Its long red legs are adapted for wading, and by them and by its black and white plumage it may be easily distinguished from other Celebesian birds.

Seebohm *(22)* recognised 11 species of Stilts and Avocets, of which the latter, numbering 5 species, are usually separated generically *(Recurvirostra)* in virtue of their webbed feet and remarkably thin and strongly upcurved bills. The present species has, perhaps, its nearest connections with the *Himantopus candidus* Bonn. of temperate Europe, Africa, and Asia, but may be distinguished from it and the other similar Stilts by its entirely white head. In *H. candidus* and the others the black of the hind neck passes on to some part of the crown or face. But the distribution of the black and white on the head and neck appears to change in a remarkable way with age, and might form a profitable field for study. In New Zealand a melanotic form occurs, producing a young one much like the young *H. leucocephalus.*

GENUS TOTANUS Bchst.

Tarsus longer than the middle toe and claw, transversely scutellated before and behind; a small hallux; bill longer than the head, slender, straight, or slightly recurved or decurved, no dertrum, but the nasal groove never encroaching into the terminal third; the loral plumes growing considerably in front of the gape; tail longer than the tarsus or equal to it, white at least at the base, as are often the lower back and rump also; wing rather long, about twice the length of the shorter secondaries, the inner secondaries much lengthened.

Migratory; almost cosmopolitan.

325. TOTANUS GLOTTIS (L.).

Greenshank.

a. **Scolopax glottis** *(1)* Linn., S. N. 1766, I, 245; *(2)* Gm., S. N. 1788, I, 664.

b. **Scolopax nebularius** *(1)* Gunner, in Leem, Lap. Beskr. 1769, 251 (fide Stejneger).

c. **Totanus canescens** *(1)* Gm., S. N. 1788, I, 668.

Totanus glottis *(1)* Bechst., Orn. Taschenb. 1803, II, 287; *(II)* Naum., Vög. Deutschl. 1836, VIII, 145, t. 201; *(III)* Gould, B. Europe IV, pl. 312; *(4)* Schl., Mus. P.-B., Scolopaces, 1864, 61; *(5)* Wald., Tr. Z. S. 1872, VIII, 97; *(6)* Salvad., Cat. Ucc. Borneo 1874, 328; *(7)* Wald., Tr. Z. S. 1875, IX, 234; *(8)* David & Oust., Ois. Chine 1877, 462; *(9)* Hume & Davis., Str. F. 1878, VI, 463; *(10)* Oust., Bull. Soc. Philom. 1878, 186; *(11)* Milne-Edw. & Grandid., Ois. Madag. 1879, I, 630; *(12)* Rosenb., Malay. Archip. 1878, 278; *(13)* Meyer, Ibis 1879, 143; *(14)* Legge, B. Ceylon 1880, 840; *(15)* Rosenb., Zool. Garten 1881, 167; *(16)* Seeb., B. Gt. Brit. 1885, III, 149; *(17)* id., Distr. Charadr. 1887, 355; *(18)* Everett, J. Str. Br.

R. A. S. 1889, 208; *(19)* Steere, List Coll. B. & M. Philipp. 1890, 26; *(20)* Seeb., B. Japan 1890, 321; *(21)* W. Blas., J. f. O. 1890, 145; *(22)* Styan, Ibis 1891, 507; *(23)* Salvad., Orn. Pap. Agg. 1891, 202; *(24)* Campb., Ibis 1892, 246; *(25)* Tacz., Faun. Orn. Sib. Orient. 1893, II, 860; *(26)* Büttik., Zool. Erg. Weber's Reise 1893, III, 283; *(27)* Newton, Dict. B. 1893, 384.

d. **Glottis glottoides** (Sykes) *(I)* Gld., B. Austr. 1848, VI, pl. 36.

e. **Totanus canescens** *(1)* Adams, P. Z. S. 1859, 169; *(2)* Finsch & Hartl., Vög. O. Afr. 1870, 745; *(III)* Sh. & Dress., B. Europe 1871, VIII, 173, pl. 570; *(4)* Hume, Str. F. 1874, II, 299; *(5)* Brügg., Abh. Ver. Bremen 1876, V, 95; *(6)* Wardl. Rams., Tweedd. Orn. Works, Index 1881, 660; *(7)* Salvad., Orn. Pap. 1882, III, 325; *(8)* Oates, B. Brit. Burmah 1883, II, 402; *(9)* W. Blas., Z. ges. Orn. 1886, 200; *(10)* E. Rams., Tab. List 1888, 20.

f. **Totanus nebularius** *(1)* Stejn., Pr. U. S. Nat. Mus. 1882, V, 37; *(2)* Baird, Brew. & Ridgw. Water B. N. Am. 1884, I, 267; *(3)* Stejn., Bull. U. S. Nat. Mus. 1885, Nr. 29, 128.

g. **Totanus littoreus** L.; *(1)* Hart., Nov. Zool. 1896, 180.

h. **Glottis nebularius** *(1)* Sharpe; Cat. B. 1896, XXIV, 481, 763.

For further synonymy and references cf. Finsch & Hartlaub *e 2*; Legge *14*; Salvadori *e 7*; Taczanowski *25*; Sharpe *h 1*, etc.

Figures and descriptions. Naumann *II*; Gould *III*, *d I*; Sharpe & Dresser *e III*; Legge *14*; Seebohm *16*, *17* (woodcut); Salvadori *e 7*; Taczanowski *25*; Sharpe *h 1*; etc., etc. — Eyton, Ost. av. 1867 figured the skeleton, pl. 8 k and 34, 1; Milne-Edwards, Ois. foss. 1867—8 some particulars; as well as Jäger, Sb. Ak. Wien 1857, XXIII, pl. II, figs. 16—17.

Winter plumage. General colour above mealy drab-brown, the feathers with dark shafts and notched at the edges with dark brown and whitish; head and hind neck duskier, striolated with white; lower back and rump white, the longest upper tail-coverts slightly barred with brown towards the tips; tail white, laterally barred with brown, the middle feathers terminally washed with ashy grey; sides of forehead, cheeks and under-parts white, the lores with dusky spots; under wing-coverts white with bars or sagittate centre-spots of dark brown; "iris light brown; bill bluish leaden at base, changing to brownish towards the tip . . .; legs and feet bluish leaden, the toes and tibiæ somewhat greenish": Legge *14* (Gorontalo: Riedel — C 274).

Changes of plumage. "The changes of plumage in the Greenshank at the four different seasons of the year are well marked. In winter it is pure white underneath, and clear ashy-grey above. In April it begins to show traces of breeding plumage, the feathers of the back exhibiting signs of approaching black, while the under surface is also spotted here and there with black on the upper part of the breast. By June the bird is in full breeding dress, very dark on the upper surface, and all the fore part of the throat and breast thickly covered with oval spots, while the flanks and under tail-coverts are also marked with blackish. By the end of July the bird begins to change, and in August rapidly passes into a somewhat lighter dress, assuming buffy white edgings to the feathers of the upper surface, while the underside of the body is quite white, excepting slight remains of dark markings on the fore part of the breast; at this season of the year the tail is very different, the centre feathers being distinctly barred, whereas at all other times they are more or less uniform grey with indications of bars only on the basal part of the feathers" (Sharpe & Dresser *e III*).

Measurements. Wing 180—193 mm; tail 75—82; bill from feathers of forehead 52—59; tarsus 57—65; middle toe with claw 35—39 (from the measurements of 8 E. Siberian examples by Taczanowski *25*, and 2 from N. Celebes in the Dresden Museum).

Moult. A specimen killed by Meyer at Limbotto in July, 1871, is shedding its remiges (C 1970).

Eggs. 4; creamy white to buff in ground-colour, blotched and spotted with rich dark brown (often forming a zone at the large end), and with underlying shell-markings of pinkish brown and grey; size 46.2—52 × 33.0—35.6 mm (from Seebohm *16*).

Nest. Sometimes close to water, or in a tuft of grass, or on a little piece of higher ground surrounded with marsh: cunningly concealed amongst the heath and short herbage, the nest is a mere depression in the ground, lined with a few bits of dry grass or withered leaves (Seebohm *16*).

Distribution. Europe; Africa; Madagascar; Asia; America as a straggler — Florida (Audubon *f 2*); through the East Indies, to Australia. — In the Celebesian area: Minahassa (Meyer *13*); Gorontalo Distr. (Forsten *4*, Rosenb. *15*, Riedel *e 9*, Meyer *13*); Bonthain (S. Müller *4*); Palima and Luwu (Weber *26*); Saleyer Island (Everett *g 1*).

The Greenshank is a wide-spread migrant, ranging from North Europe and North Asia south to Cape Colony and Australia. It is absent from New Zealand, but it has been known to straggle to Florida. It breeds in Northern Europe, in some places in Scotland and the Hebrides, and v. Middendorff *(25)* observed it nesting plentifully on the eastern slopes of the Stanowoi Mts., N. E. Siberia, while it was not rare on the marshes down to the coast. This is the only record of its breeding in Siberia given by Taczanowski *(25)*. Through S. E. Siberia from Irkutsk to the Sea of Japan Dybowski and Godlewski observed it only in the spring and autumn migrations. In Bering Island Stejneger *(f 3)* says it occurs regularly in the spring migration; Nikolski only saw it on migration in Sakhalien; Campbell *(24)* records it as extremely common in spring and autumn in Corea, though Kalinowski speaks of it as common there in passage in autumn, rare in spring. It winters in China — in the Lower Yangtse basin according to Styan *(22)*, and at Swatow according to De La Touche, though it does not stay at Foochow. In Celebes Meyer *(13)* got it in summer, viz. at Kakas in June and at Lake Limbotto in July. These individuals were of course left out of the general migration; why, it is impossible to say. One is before us (♀ Limbotto, July) and is in winter plumage, assuming fresh remiges. Ordinarily the bird is most likely only a winter visitor to the island.

From the allied species which occur in Celebes with it the Greenshank may be distingnished on the wing by its large size, its white lower back and rump, its dark wings in which no white tips or band are present, and the loud piping call of "yo-yo-yo" with which it starts up and repeats vociferously.

326. TOTANUS CALIDRIS (L.).

Common Redshank.

a. **Scolopax calidris** *(1)* Linn., S. N. 1766, I, 245.
Totanus calidris *(1)* Bechst., Orn. Taschenb. 1803, II, 284; *(II)* Naum., Vög. Deutschl. 1836, VIII, 95, t. 199; *(III)* Gould, B. Europe IV, pl. 310 (1835); *(IV)* id., B. Gt. Brit.

IV, pl. 54 (1870); *(5)* Schl., Mus. P.-B., Scolopaces, 1864, 65; *(6)* Wald., Tr. Z. S. 1872, VIII, 96; *(7)* Salvad., Cat. Ucc. Borneo 1874, 328; *(8)* Hume, Str. F. 1874, II, 299; *(IX)* Dresser, B. Eur. 1875, VIII, 157, pl. 567, f. 1, pl. 568, f. 2, pl. 569; *(10)* David & Oust., Ois. Chine 1877, 464; *(11)* Rosenb., Malay. Archip. 1878, 278; *(12)* Hume & Davis., Str. F. 1878, VI, 464; *(12bis)* Hume, ib. 1879, VIII, 70; *(13)* Tweedd., P. Z. S. 1879, 73; *(14)* Legge, B. Ceylon 1880, 852; *(15)* Rosenb., Zool. Garten 1881, 167; *(16)* Wardl. Rams., Tweedd. Orn. Works, Index 1881, 660; *(17)* Oates, B. Brit. Burmah 1883, II, 404; *(18)* Guillem., P. Z. S. 1885, 561; *(19)* Seebohm, Brit. B. 1885, III, 140; *(20)* id., Distr. Charadr. 1887, 353; *(21)* W. Blas., Ornis 1888, 320; *(22)* Everett, J. Str. Br. R. A. S. 1889, 208; *(23)* Steere, List Coll. B. & M. Philipp. Is. 1890, 26; *(24)* Whitehd., Ibis 1890, 59; *(25)* Seeb., B. Japan 1890, 321; *(26)* Hagen, T. Ned. Aard. Genoots. 1890, (2) VII, 164; *(27)* Styan, Ibis 1891, 507; *(28)* De La Touche, Ibis 1892, 500; *(29)* Büttik., Zool. Erg. Weber's Reise in Ost-Ind. 1893, III, 283; *(30)* Tacz., Faune Orn. Sib. Orient. 1893, II, 866; *(31)* Bns. & Worces., B. Menage Exped. 1894, 31; *(32)* Newton, Dict. B. 1894, 774; *(33)* Hart., Nov. Zool. 1896, 180; *(34)* Sharpe, Cat. B. 1896, XXIV, 414, 758.

"Lori" (Sandpiper), Minahassa, Nat. Coll.

For further synonymy and references confer Naumann *II*; Dresser *IX*; Legge *14*; Taczanowski *30*; Sharpe *34*, etc.

Figures and descriptions. Naumann *II*; Gould *III, IV*; Dresser *IX*; Legge *14*; Seeb. *19, 20*; Oates *17*; Taczanowski *30*; Sharpe *34*, etc., etc.

Winter plumage. Above drab-brown, the inner wing-coverts and tertiaries edged with whitish and notched with dark brown bars; lower back and rump white; upper tail-coverts and tail white barred with brown; primary coverts and primaries dark brown; secondaries and adjacent parts of the inner primaries white, the basal parts of the feathers more or less brown, primary coverts broadly tipped with white where they lie upon the white of the secondaries; supraloral stripe white passing to above the eye; lores and ear-coverts drab; cheeks and under-parts white, clouded with brown on sides of breast, streaked with brown on cheeks, jugulum, breast, and flanks, taking an irregular bar-shape on sides of breast, under tail-coverts and edge of wing below; "iris reddish or yellowish brown; bill black, upper mandible with the base as far as the nostril reddish, and nearly half the under mandible red (the amount of red variable); legs and feet orange-red, joints in some greyish": Legge *14* (Tondano neighbourhood, Aug.—Sept. 1892: Nat. Coll. — C 10957).

Moult. The specimen described has remains of summer plumage, the tertiaries, some feathers on the mantle, scapulars and wing-coverts being old feathers of that season. The remiges are new. We conclude that its moult must have commenced immediately after the breeding season (probably the end of June or beginning of July), and that it would have lasted in this specimen till at least the end of September. As Naumann points out *(II)*, the Redshank moults twice a year.

Breeding plumage. In summer the upper-parts are greenish drab, with streaks of blackish on the head, neck, and mantle, and irregular bars on the other upper-parts; lower back etc. as in winter white; below white, striated with brown on throat and fore neck, taking more the form of drop-streaks on breast and sagittate spots on sides; remiges as in winter (Semipalatinsk, Siberia — Nr. 11300).

Measurements. Wing 150—164 mm; tail 54—70; tarsus 45—52; middle toe with claw 30.5—34; bill from gape 47—51 mm (from Legge *14* and Taczanowski *30*).

Eggs. 4; pyriform; ground-colour very pale buff to rich ochraceous buff, spotted and blotched with rich dark brown, with underlying spots of paler brown and grey; size 42—48 × 30—33 mm (from Seebohm *19*).

Nest. Placed on the ground, often in a grass-tuft, or beneath the shade of a tall weed or little bush of heath, sometimes amongst drifted rubbish above high-water mark: the hollow formed by the bird is sometimes lined with a few dead bents, straws, scraps of moss, etc. (from Seebohm *19*).

Distribution. Europe; Africa; Asia; the East Indies as far as Java and Celebes. — S. E. Siberia (v. Middend., Kalinowski etc. *30*); N. E. Mongolian frontier (Radde *30*); Corea (Kalin. *30*); Sakhalien (Nikolski *30*); Japan — Nipon (Pryer *25*); China (David *10*, Styan *27*, De La Touche *29*); India (Jerdon, etc. *14*); Ceylon (Legge, etc. *14*); Andamans (Davison *8*); Nicobars (v. Pelzeln *IX*); Burmah (Oates *17*); Tenasserim (Davison *12*); Cochin China (fide Oates *17*); Singapore (Hume *12bis*); Sumatra (Hagen *30*); Java (Kuhl & v. Hasselt *5*); Bawean (Diard *5*); Borneo (Schwaner, etc. *5*, *22*); Philippines — Palawan (Platen *21*, Whitehead *24*), Cebu (Bourns & Worces. *31*), Negros and Siquijor (Steere *23*), Basilan (Everett *13*, *16*); Celebes — (Forsten *5*), Minahassa (Guillem. *18*, Nat. Coll.), Gorontalo District, Limbotto (Rosenb. *15*), Luwu (Weber *29*); Saleyer (Everett *33*).

The Common Redshank is found from Iceland and Lapland as far south in winter as Cape Colony, and from E. Siberia to Java and Celebes. It is, however, less arctic in its habitat than its relatives *T. glottis* and *T. glareola*; it breeds not only in Iceland and Northern Europe, but also in England, Germany — among other spots near Dresden, in Holland, and Col. Irby *(14)* records it as nesting in numbers in the marismas of some parts of the Guadalquivir in Spain. Moreover it is a bird rather of Europe and Western Asia than of North-east Asia. Taczanowski *(30)* points out that Dybowski and Godlewski did not procure any examples in S. E. Siberia, and Steller and Dybowski did not see it in Kamtschatka. Stejneger makes no mention of it from Bering Island, von Middendorff got only one specimen on the shore of the Sea of Ochotsk, Kalinowski only two in Amurland, Nikolski found it rare in Sakhalien, and Seebohm *(25)* records only one specimen from Japan. On the other hand Radde found it breeding in great numbers on the Tareï Nor on the Mongolian frontier, it is common in Corea during the autumn migration according to Kalinowski *(30)*, it is perhaps the commonest wader in China during migration time according to Abbé David *(10)*, a statement confirmed by De La Touche as regards Swatow, South China. It is not said to winter in the country except by Swinhoe *(14)*. From these statements we conclude that the species migrates first east and then south, or fairly direct S. E. from Central Siberia or further west. It winters plentifully in Ceylon according to Legge *(14)*, in Burmah according to Oates *(17)*, and in Tenasserim from the observations of Davison *(12)*. It seems to be a somewhat scanty visitor to Celebes and the other Great Sunda Islands, where it has escaped the notice of many collectors.

When the Common Redshank starts up in flight it is at once recognisable by its white secondaries and lower back and rump, and, should its nest or chicks be near, it flies in wide circles with a light but somewhat jerky flight round the intruder, uttering an incessant cry of anxiety or warning, "kei-kei-kei", or varying this note with a loud whistle like "giff", the call-note of the

species. Occasionally it will settle daintily, but with some difficulty, on the top of a neighbouring stake, but it is rarely seen except on the ground, where, immediately after settling, it raises its wings high and folds them nicely to its sides. Free from anxiety it frequently, as it flies, gives vent to its melodious love-note, "tra-liddle-tra-liddle-tra-liddle" (Wiglesw., Moritzburg). It inhabits swampy ground by lakes, rivers and the sea-shore, feeding upon small molluscs, worms, insects, etc.

Dr. Sharpe remarks *(34)*: "The Eastern Redshanks from Central Asia and India are much more richly coloured in the breeding season than European individuals, being much more rufous, and having the inner median coverts rufous with distinct blackish bars. The European specimens appear to be always more dusky, both in winter and summer plumage".

327. TOTANUS GLAREOLA (L.).

Wood Sandpiper.

a. **Tringa glareola** *(1)* Linn., S. N. 1766, I, 250.

Totanus glareola *(1)* Temm., Man. d'Orn. 1815, 421; *(II)* Naum., Vög. Deutschl. 1836, VIII, 78, t. 198; *(III)* Gld., B. Europe 1837, IV, pl. 315, f. 2; *(IV)* id., B. Gt. Brit. IV, pl. 57 (1870); *(5)* Schl., Mus. P.-B., Scolopaces, 1864, 71; *(6)* Swinh., P. Z. S. 1871, 406; *(7)* Salvadori, Cat. Ucc. Borneo 1874, 327; *(8)* Hume, Str. F. II, 1874, 298; *(9)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 680; *(10)* Brügg., Abh. Ver. Bremen 1876, V, 95; *(11)* David & Oust., Ois. Chine 1877, 464; *(XII)* Dresser, B. Europe VIII, 143, pl. 565 (1877); *(13)* Rosenb., Malay. Archip. 1878, 278; *(14)* Seeb., Ibis 1879, 152; *(15)* Legge, B. Ceylon 1880, 857; *(16)* Rosenb., Zool. Garten 1881, 167; *(17)* Kelh., Ibis 1882, 17; *(19)* Salvad., Orn. Pap. III, 1882, 323; *(20)* Vorderm., N. T. Ned. Ind. 1883, XLII, 99; *(21)* Oates, B. Brit. Burmah 1883, II, 401; *(22)* Stejn., Bull. U. S. Nat. Mus. 1885, Nr. 29, 130; *(23)* Guillem., P. Z. S. 1885, 561; *(24)* W. Blas., Ztschr. ges. Orn. 1885, 314; *(25)* Seeb., Brit. B. 1885, III, 132; *(26)* id., Distr. Charadr. 1887, 365; *(27)* W. Blas., Ornis 1888, 320; *(28)* Everett, J. Str. Br. R. A. S. 1889, 208; *(29)* Whitehd., Ibis 1890, 59; *(30)* Sharpe, t. c. 144, 285; *(31)* Seeb., B. Japan 1890, 324; *(32)* Hagen, T. Ned. Aard. Genoots. 1890, (2) VII, 164; *(33)* Styan, Ibis 1891, 507; *(34)* Salvad., Orn. Pap. Agg. 1891, 202; *(35)* De La Touche, Ibis 1892, 500; *(36)* Tacz., Faune Orn. Sib. Orient. 1893, II, 874; *(37)* Büttik., Zool. Erg. Weber's Reise in Ost-Ind. 1893, III, 282; *(38)* M. & Wg., J. f. O. 1894, 251; *(39)* Bns. & Worces., B. Menage Exped. 1894, 31; *(40)* Newton, Dict. B. pt. III, 1894, 812; *(41)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 9, p. 8; *(42)* Grant, Ibis 1895, 472; *(43)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 6.

b. **Totanus affinis** *(1)* Horsf., Tr. L. S. 1821, XIII, 191.

c. **Rhyacophilus glareola** *(1)* Kaup, Natürl. Syst. 1829, 140; *(2)* Wardl. Rams., Tweedd. Orn. Works 1881, 660; *(3)* A. Müll., J. f. O. 1882, 435; *(4)* Steere, List Coll. B. & M. Philipp. 1890, 26; *(5)* Sharpe, Cat. B. 1896, XXIV, 490, 764.

d. **Actitis glareola** *(1)* Wald., Tr. Z. S. VIII, 1872, 96; *(2)* Meyer, Ibis 1879, 142.

"Lorie" (Sandpiper), Minahassa, Nat. Coll.

"Bararanga sutarangej", Kabruang and Karkellang, Talaut, iid.

"Kea-kea", Tjamba Distr., Platen *24.*

For further synonymy and references cf. Dresser *XII*; Legge *15*; Salvadori *19*; Stejneger *22*; Taczanowski *36*; Sharpe *c 5*.

Figures and descriptions. Naumann *II*; Gould *III, IV*; Dresser *XII*; Seebohm *25, 26* (woodcut); Legge *15*; Salvad. *19*; Vorderman *20*; Oates *21*; Taczanowski *36*; Sharpe *c 5*; etc., etc.

Winter plumage. Above bistre-brown, margins of the feathers paler, changing into whitish notches with intermediate dark brown bars on the scapulars and tertiaries, and into spots on the wing-coverts; upper tail-coverts white, the longest with sagittate spots of brown; tail barred with brown and white, the outermost feathers white, only spotted with brown; remiges dark brown, shaft of first white; supraloral and superciliary stripe whitish; lores and ear-coverts brown; under-parts white, striated with brown on sides of face and jugulum, clouded with pale brown on breast; sides and flanks scantily barred, under tail-coverts shaft-streaked with brown; under wing-coverts white, with bars of brown, axillaries narrowly barred; "iris dark brown; bill blackish olive; below at base lighter brownish olive; feet light greyish olive": Stejneger *22* (Manado: v. Musschenbroek — C 5265).

Female. Not known to differ from the male.

Summer plumage. In summer the bird is darker in colour above than in winter, and the neck, breast and jugulum are thickly streaked with brown.

Young in first plumage. Has the lateral spots of the feathers of the upper parts fulvous, instead of whitish (Archangel: Henke — Nr. 12119).

Observation. The white lateral spots on the feathers of the upper parts mark the site of a structural difference in the feathers, namely the web is less substantial at these spots, and, as the plumage becomes old, the web breaks away or is worn off here, leaving the feather with a jagged saw-like edge well seen in the tertiaries. It is displayed in a more or less pronounced condition in a number of specimens before us.

Moult. A specimen killed near Tondano in August—September, 1892, and three from Limbotto, July, 1871, are shedding their remiges and acquiring fresh ones. The tertiaries are not yet moulted, nor indeed in 2 examples killed in Talaut in November, but the feathers of the upper parts seem to be shed later than the remiges. Seebohm *(25)* mentions a specimen killed by Emin in Central Africa on February 15th with growing first primaries.

Measurements. Wing (11 specimens — Celebes and the islands near) 119—129 mm; tail ca. 50; tarsus 37—41; middle toe with claw ca. 34; exposed culmen 26—30.

Eggs. 4; creamy white to dull buff and very pale olive, spotted and blotched with rich reddish brown, the spots varying in size from a pea downwards; size 35.6—39.4 × 25.4—27.9 mm (from Seebohm *25*).

Nest. A patch of dry ground overgrown with heath, sedges, and coarse grass is generally selected: the nest a mere hollow in the ground, lined with a few dry stalks and blades of grass (from Seebohm *25*).

Distribution. Europe; Africa; Asia, south to the Moluccas and Timor. — For localities in the East Indies see Salvadori *19*, adding Sumatra (Davis. *8*, Hagen *32*), and some additional Philippine Is. (Bns. & Worces. *39*, Platen *27*, Whitehead *29*). In the Celebesian Province: Talaut Islands — Kabruang and Karkellang (Nat. Coll. *38, 41*), Minahassa (Meyer *d 2*, Guillemard *23*, etc.), Gorontalo Distr. (Forsten *5*, Meyer *d 2*, Rosenb. *16*), Tjamba Distr. (Platen *24*), Macassar (Weber *37*).

The distribution of the Wood Sandpiper is much like that of the Common Sandpiper, except that the latter ranges as far south as Tasmania, while the

present species is known only as far as the Moluccas. Both alike are absent in America and New Zealand, but are distributed over nearly all parts of the Old World. As shown by Mr. Dresser the Wood Sandpiper has been known to breed in England, it breeds more or less plentifully in Norway, Sweden, Denmark, Holland, parts of Germany, Finland, North Russia. Seebohm *(14, 25)* found it extremely common in summer in the valleys of the Yenesei and Obi; v. Middendorff *(36)* says it nests somewhat numerously in N. Siberia on the Boganida, Prjevalsky records it *(36)* as nesting in Ussuriland, Nikolski in Sakhalien, Stejneger *(22)* in Bering Island. According to Dybowski and Godlewski *(36)*, Prjevalsky *(36)*, Abbé David *(11)*, Swinhoe *(15)* and De La Touche *(35)* it passes over Lake Baikal, Lake Khanka, and China, as a bird of passage. In winter Legge remarks *(15)* that it is extraordinarily abundant in Ceylon, and adds that "at the end of April, and during the first week in May, they collect in very large flocks and fly northward during the night; and one year on the 28th April immense numbers passed over Colombo after dark, piping loudly". Oates finds it less abundant in Burmah. Whitehead *(29)* speaks of it as fairly common in the migratory season in Borneo. It is, apparently, a fairly common winter visitor to the Celebesian group, and we have three in winter plumage killed by Meyer at Limbotto in July, which, probably, had remained there through the summer.

The present species may be easily distinguished, even in flight, from *Actitis hypoleucos* by the absence of the white cross-band on the remiges; from *T. calidris* by the absence of the white terminal half of the secondaries; from *T. glottis* by its small size and brown (not white) lower back and rump. Its nearer relative *T. ochropus* has the lower rump and upper tail-coverts pure white (as against the middle part of the tail-coverts only in *glareola*), and its legs and feet greenish blue or bluish green.

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Differs from *Totanus* chiefly by its short legs and more pointed wing. Tarsus a little longer than the middle toe and claw, but shorter than the bill, and only about 1/5 the length of the wing; secondaries less than half the wing-length; no white on tail or rump.

Migratory; found chiefly on the coasts and islands of the Pacific.

328. HETERACTITIS BREVIPES (Vieill.).

West Pacific Sandpiper.

a. **Totanus brevipes** *(1)* Vieill., Nouv. Dict. VI, 410 (1816); *(2)* Swinh., Ibis 1863, 407; *(3)* Rams., Pr. L. Soc. N. S. W. 1876, I, 375; *(4)* Sharpe, Ibis 1888, 203; *(5)* Everett, J. Str. Br. R. A. S. 1889, 208; *(6)* Whitehd., Ibis 1890, 59; *(7)* Sharpe,

t. c. 144, 285; *(8)* Wilson, B. Sandw. Is. pt. III, 1892; *(9)* Büttik., Zool. Erg. Weber's Reise 1893, III, 283; *(10)* Grant, Ibis 1896, 126.

b. **Totanus pulverulentus** *(1)* S. Müll., Verh. Natuur. Comm. 1839—43, 152; *(II)* Temm. & Schl., Faun. Jap. Aves 1850, 109, t. 65; *(3)* Radde, Reise S.-O. Sibir. 1863, 326; *(4)* Meyer, J. f. O. 1873, 405; *(5)* id., Ibis 1879, 143; *(6)* id., J. f. O. 1883, 149.

c. **Totanus griseopygius** *(1)* Gld., P. Z. S. 1848, 39; *(II)* id., B. Austr. 1848, VI, pl. 38.

d. **Totanus incanus** *(1)* Schl. (nec. Gm.), Mus. P.-B., Scolopaces, 1864, 74; *(2)* Salvad., Cat. Ucc. Borneo 1874, 329, pt.; *(3)* id., Ann. Mus. Civ. Gen. 1876, IX, 63; *(4)* David & Oust., Ois. Chine 1877, 466, pt.; *(5)* Tweedd., P. Z. S. 1877, 550, 768; *(6)* id., P. Z. S. 1878, 345, 711; *(7)* Salvad., Orn. Pap. 1882, III, 320, pt.; *(8)* W. Blas., J. f. O. 1883, 149; *(9)* Meyer, Isis, Dresden 1884, 6, 55; *(10)* Sharpe, Report Voy. "Alert" 1884, 27; *(11)* W. Blas., Z. ges. Orn. 1886, 200; *(12)* id., Ornis 1888, 320, 628; *(13)* Rams., Tab. List 1888, 20; *(14)* Steere, List Coll. B. & M. Philipp. Is. 1890, 26; *(15)* Seeb., B. Japan. 1890, 323; *(16)* Wiglesw., Av. Polyn. 1892, 65, pt.; *(17)* Ribbe, Jb. Ver. Erdk. Dresden 1892, 173; *(18)* M. & Wg., J. f. O. 1894, 251; ? *(19)* Tristr., Ibis 1895, 31; *(20)* Vorderm., N. T. Ned. Ind. 1895, LIV, 322.

e. **Actitis incanus** *(1)* Finsch & Hartl., Orn. Centralpol. 1867, 182, pt.

Heteractitis brevipes *(1)* Stejn., Bull. U. S. Nat. Mus. 1885, Nr. 29, pp. 133—138; *(2)* id., Pr. U. S. Nat. Mus. 1887, X, 133; *(3)* Schalow, J. f. O. 1891, 261; *(4)* Salvad., Orn. Pap. Agg. 1891, 202; *(5)* Sharpe, Cat. B. 1896, XXIV, 449, 761.

f. **Totanus incanus brevipes** *(1)* Seeb., Distr. Charadr. 1887, 335; *(2)* id., Ibis 1890, 104.

g. **Heteroscelus brevipes** *(1)* Tacz., Faun. Orn. Sib. Orient. 1893, II, 877.

"Lorie besar", Minahassa and islands off the coast; Nat. Coll.

"Kingkedudu", Siao; iid.

"Tengkarubatong", Gt. Sangi; iid.

"Bararanga bahejwa", Kabruang, Talaut; iid.

For further synonymy and references cf. Stejneger *1*, Taczanowski *g 1*, Salvadori *4* and (excluding references to Polynesia and North America) *d 7*; Sharpe *5*.

Figures and descriptions. Gould *c II*; Temm. & Schl. *b II*; Stejneger *1*; Seebohm *f 1* (diagn.); Taczanowski *g 1*; Sharpe *5*.

Winter plumage. Above grey-drab, the feathers with greyer tips; greater wing-coverts and upper tail-coverts tipped with whitish, forming on wing a narrow bar; primaries and their coverts blackish brown, the inner ones drab, shafts brown, that of the outermost whitish, secondaries and inner primaries narrowly seamed with whitish; sides of forehead and superciliary stripe whitish; loral stripe dusky, passing on to ear-coverts; malar region, chin, throat and under-parts white, clouded with grey and buffy white on jugulum and sides of breast; sides of body grey-drab, axillaries and under wing-coverts darker, the latter tipped and edged with white; "iris chocolate-brown; legs and feet dirty chrome; nails black; bill dark dull grey [blackish], base yellow": Everett *d 6* (Main, Minahassa, 25. Jan. 1894: Nat. Coll. — C 13264).

Breeding plumage. In spring the under-parts are white marked with wavy or open **V**-shaped bars of grey-brown, cheeks and throat spotted, middle of abdomen and under tail-coverts clear of spots and bars (except one or two on sides of tail-coverts); upper parts much as in winter, but darker, the feathers tipped with whitish; upper tail-coverts more or less barred with white and brown (Manado tua, 8th April, 1893: Nat. Coll. — C 12102).

Measurements.

	Wing	Tail	Exp. culmen	Length of nasal groove	Tarsus	Mid. toe with claw
a. (C 12102) ad., Manado tua, 8. IV. 93 (Nat. Coll.)	161	70	37	19	33	29
b. (C 12101) ad., Manado tua, 8. IV. 93 (Nat. Coll.)	165	69	—	19	34	30
c. (C 12103) ad., Mantehage, 23. IV. 93 (Nat. Coll.)	161	67	38	18	31	29
d. (C 13264) ad., Minahassa, 25. I. 94 (Nat. Coll.)	—	65	38	18	31	29
e. (C 13265) ad., Minahassa, 29. I. 94 (Nat. Coll.)	168	71	40	19	33	31
f. (C 10948) ad., Minahassa, Aug.—Sept. 92 (N. C.)	164	68	40	23	34	32
g. (C 10947) juv.? Minahassa, Aug.—Sept. 92 (N.C.)	169	70	40	20	33	30
h. (C 1950) ad., Minahassa, March, 71 (Meyer) .	—	70	—	20	34	30
i. (C 1960) ad., Minahassa, March, 71 (Meyer) .	158	63	—	19	31	29
j. (C 1949) ad., Minahassa, March, 71 (Meyer) .	161	66	38	19	34	30
k. (C 1951) ad., Minahassa, March, 71 (Meyer) .	—	65	38	21	33	—
l. (C 3568) ad., Minahassa (Faber)	—	71	41	20	33	30
m. (C 3567) ad., Minahassa (Faber)	—	65	—	—	33	31
n. (C 907) ad., Siao (Meyer)	—	66	38	19	33	30
o. (C 12632) ad., Siao, 1. VII. 93 (Nat. Coll.) .	166	69	38	19	32	30
p. (C 3651) ad., Gt. Sangi (Meyer)	165	68	38	20	33	30
q. (C 12666) ad., Gt. Sangi, 28. VII. 93 (Nat. Coll.)	158	62	38	22	33	29
r. (C 13035) ad., Kabruang, 2. XI. 93 (Nat. Coll.)	163	67	38	19	32	30
s. (C 13036) juv.? Kabruang, 5. XI. 93 (Nat. Coll.)	163	68	37	19	31	29

Moult. Of the above Celebesian examples: two *(d, e)* killed late in January are growing fresh primaries, viz. all but the first ones (the outermost) in each wing are new, the second ones just sprouting; three *(a, b, c)* killed in April have new and perfect remiges, but are changing the contour feathers of the upper-parts; under-parts in summer dress; one *(o)*, dated 1st July, has the four outermost primaries new (the first growing), the succeeding two or three inner ones old, as perhaps others; the upper-parts mostly with new winter feathers; one, dated 28th July, is in much the same condition as the last, the two outermost primaries on one side, the three outermost on the other, being new; both specimens in full winter dress below; one *(f)*, August—September, is a little more advanced than the last; one *(r)*, 2nd November, is in nearly complete winter dress, the primaries are new but many not full grown, some of the secondaries and tertiaries seem to be old.

The above seem to be adult birds. The inference is that winter dress is assumed on the under-parts before July; that winter dress is assumed on the upper-parts from July to September; that breeding plumage on the under-parts makes its appearance before April; that the upper-parts assume breeding plumage about April; that the primaries are moulted from July and earlier till September, the wing being probably complete in November—December, but, as we have specimens assuming fresh outer primaries at the end of January, we are undecided as to whether the bird sheds its quills twice or only once a year, in the latter case the process lasting over several months. (See, also, Young.)

Sexes. They are not known to differ.

Young? Two specimens *(g, s, supra)* which we take for birds of the year, are like the adult in summer plumage. One of these two killed on 5th November is still in plumage of the breeding type below and only commencing to assume winter plumage above, whereas those which we take for adults are in winter dress below (partly above) as

early as July. The bird which Taczanowski *(g 1)* describes as young, and that of the allied *H. incanus* which Mr. S. B. Wilson figures (*a 8*, hinder fig.), appear to us to relate to the winter dress of the species, whether old or young.

Eggs. Unknown.

Distribution. N. E. and E. Siberia (Middendorff, Dybowski, etc. *g 1*); Baikal (Radde *b 3*); Bering Id. (Stejneger *1*); Sakhalien (Nikolski *g 1*); Kurile Is., Japan, Loochoo Is., Bonin Islands (Seebohm *d 15*); China (David *d 4*), Formosa (Swinhoe *a 2*); Philippines (Challenger Exp., Everett, etc. *d 5*, *d 6*, *d 12*, *d 14*); Borneo (S. Müller, etc. *d 5*); Talaut Is. — Kabruang (Nat. Coll.); Great Sangi (Meyer *d 9*, Bruijn *d 3*, Nat. Coll.), Siao (Meyer *d 9*, Nat. Coll.); Celebes — Manado tua and Mantehage (Nat. Coll.), Minahassa (Meyer *b 4*, etc.), Gorontalo Distr. (Riedel *d 11*), Luwu (Weber *a 9*); Moluccas and Papuasia (Salvadori *d 7*, *4*); Australia (Ramsay *d 13*).

So far as can as yet be judged this Sandpiper inhabits the countries washed by the West Pacific and its seas, breeding in some unknown quarters in the high north and migrating south in winter, probably as far as Australia. Until 1885 it was believed to have a much wider range, to wander all over the islands of the Pacific as far as New Zealand and down the west coast of N. America from Alaska to California, in addition to the territories enumerated; but Stejneger has shown that the East Pacific birds belong to a different species *H. incanus*, having the nasal groove about $^2/_3$ as long as the exposed culmen (instead of about $^1/_2$ as in *brevipes*), while the middle of the abdomen and the under tail-coverts, like the other under-parts, are uniformly barred with blackish grey in the breeding dress (the under tail-coverts and abdomen being white and unbarred in *brevipes*), the upper tail-coverts of *incanus* are only tipped, not barred, with white, and its size is somewhat larger. Seebohm *(f 1)* also points out that the tarsus of *incanus* is reticulated at the back, of *brevipes* scutellated. Owing to the former confusion of the two species it is impossible to define their geographical ranges with exactitude; it is necessary that the whole of the material should be looked through again. It is probable, for instance, that *H. brevipes* occurs in some of the western parts of Polynesia, and both are known to range to Bering Island and the Bonin Islands. Dr. Stejneger considers the two forms perfectly distinct, and we find it easy to separate the series in the Dresden Museum (those from the Celebesian area, Buru, and Timor being *brevipes*, one from Samoa *incanus*), but Seebohm was of opinion that they intergrade.

The genus *Heteractitis*, represented only by these two forms, is intermediate between *Actitis* and *Totanus*, differing from the former by its long primaries, the distance from the carpus to the tips of the outer secondaries being less than half the length of the wing (in *Actitis* it is more than half), by its bill, which is much stronger and closely similar to *Totanus*, and by the absence of the white bar across the primaries; from *Totanus* it differs principally by its short tarsus, which is shorter than the bill and only about $^1/_5$ the length of

the wing, and by the absence of white on the rump and upper tail-coverts, as well as the tail. Small structural differences should not, in our opinion, be made use of for setting up new genera where this can possibly be avoided, but, in the present case, if *Heteractitis* were united with *Totanus*, *Actitis* would have to follow, and the barrier again between *Tringa* and *Actitis* is equally small.

Dr. Stejneger describes *H. brevipes* in its habits as follows: "This bird makes quite a different impression on the observer from the other totanine wanderers, and its habits seem to be rather peculiar, in many respects reminding one of the Oyster-catcher. It carries its body much in the same manner as *Actitis hypoleucos*, but very seldom flirts its tail up and down like the latter, nor has it as much of the peculiar movement of the head and neck as the common Sandpiper. It is a much more quiet bird, very often standing immovable for a long while staring down into the water. Its flight is graceful and very rapid. Its voice loud and harsh, almost screaming. I only met with it among rocks and stones, seldom, if ever, on the sandy or gravelly beaches" *(1)*.

GENUS ACTITIS III.

Differs from *Totanus* chiefly by its more delicate bill in which the nasal groove is continued into the terminal third almost to the tip, by its short tarsus, and by the absence of white on the base of the tail and rump. From *Heteractitis* it is distinguishable by its less pointed wing, the secondaries being more than half the wing-length, by its bill, and by the bar of white across the middle of the remiges on the inner webs, exposed by the bird when in flight. Two species, one American, the other belonging to the Old World; migratory.

329. ACTITIS[1]) HYPOLEUCOS (L.).

Common Sandpiper.

a. **Tringa hypoleucos** *(1)* Linn., S. N. 1766, I, 250.

Actitis hypoleucos *(1)* Illig., Prodr. 1811, 262; *(2)* Boie, Isis 1822, 560; *(III)* Naum., Vög. Deutschl. 1836, VIII, 7, t. 194; *(4)* Schl., Mus. P.-B., Scolopaces, 1864, 80; *(5)* Walden, Tr. Z. S. 1872, VIII, 96; *(6)* Hartlaub, Vög. Madag. 1877, 327; *(7)* Rosenb., Malay. Archip. 1878, 278; *(8)* Oust., Bull. Soc. Philom. 1878, 186; *(9)* Milne-Ed. & Grandid., Ois. Madag. 1879, I, 622; *(10)* Meyer, Ibis 1879, 143, 146; *(11)* Rosenb., Zool. Garten 1881, 167; *(12)* Stejn., Bull. U. S. Nat. Mus. 1885, Nr. 29, 131; *(13)* Rams., Tab. List 1888, 20; *(14)* Wiglesw., Av. Polyn. 1892, 64; *(15)* Ribbe, Jb. Ver. Erdk. Dresden 1892, 172; *(16)* Tacz., Faun. Orn. Sib. Orient. 1893, II, 882; *(17)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 15.

b. **Totanus hypoleucos** *(1)* Temm., Man. d'Orn. 1815, 424; *(II)* Dresser, B. Europe VIII, 127, pl. 563 (1877); *(3)* Seeb., Brit. B. 1885, III, 117, pl. 30 (eggs); *(4)* id., Distr.

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[1]) Dr. Stejneger (Bull. U. S. Nat. Mus. 1885, Nr. 29, 131) shows how, by elimination, *hypoleucos* had become the type of the genus *Actitis* of Illiger as early as 1816; by the Rules of Nomenclature, therefore, *Tringoides* Bp., 1831, may not displace *Actitis*.

Charadr. 1887, 371; *(5)* Büttik., Notes Leyd. Mus. 1887, 79; *(6)* Seeb., B. Japan 1890, 326; *(7)* Hagen, T. Ned. Aard. Genoots. 1890, (2) VII, 164; *(8)* Seebohm, Ibis 1892, 97; *(9)* Büttik., Zool. Erg. Weber's Reise 1893, III, 282, 289; *(10)* Oust., Nouv. Arch. du Mus. 1894, (3) VI, 92; *(11)* M. & Wg., J. f. O. 1894, 251; *(12)* iid., Abh. Mus. Dresd. 1895, Nr. 8, p. 18.

c. **Actitis empusa** *(1)* Gould, P. Z. S. 1847, 222; *(II)* id., B. Austr. 1848, VI, pl. 35.

d. **Tringoides hypoleucos** *(1)* Heugl., Vög. N. O. Afr. 1871, I, pt. 2, 1172; *(2)* Salvad., Cat. Ucc. Borneo 1874, 326; *(3)* id., Ann. Mus. Civ. Gen. 1876, IX, 63; *(4)* David & Oust., Ois. Chine 1877, 467; *(5)* Hume & Davis., Str. F. 1878, VI, 463; *(6)* Legge, B. Ceylon 1880, 867; *(7)* Wardl. Rams., Tweedd. Orn. Works 1881, 660; *(8)* Kelh., Ibis 1882, 18; *(9)* Salvad., Orn. Pap. 1882, III, 318; *(10)* W. Blas. & Nehrk., Verh. z.-b. Ges. Wien 1882, 430; *(11)* Oates, B. Brit. Burmah 1883, II, 399; *(12)* W. Blas., Verh. z.-b. Ges. Wien 1883, 71; *(13)* Meyer, Z. ges. Orn. 1884, 295; *(14)* id., Isis, Dresden 1884, 6, 55; *(15)* Guillem., P. Z. S. 1885, 560; *(16)* W. Blas., Z. ges. Orn. 1886, 165; *(17)* id., Ornis 1888, 319, 628; *(18)* Everett, J. Str. Br. R. A. S. 1889, 208; *(19)* Steere, List Philipp. 1890, 26; *(20)* Oates ed. Hume's Nests & Eggs 1890, III, 352; *(21)* Salvad., Orn. Pap. Agg. 1891, 201; *(21bis)* id., Ann. Mus. Civ. Gen. 1891, (2) XII, 75; *(XXII)* Meyer, Abb. v. Vogelskel. II, 1892, 34, t. CLXII; *(23)* Bourns & Worcester, B. Menage Exped. 1894, 31; *(24)* Everett, Ibis 1895, 32; *(25)* Sharpe, Cat. Birds 1896, XXIV, 456, 762; *(26)* Hart., Nov. Zool. 1896, 590.

e. **Sandpiper** *(1)* Newton, Dict. B. 1894, 810.

"Lorie (a general name for Sandpipers) **ketjil"** (little), Minahassa, Nat. Coll.

"Bararanga adiva", Kabruang, Talaut, iid.

For further synonymy and references cf. Naumann *III*; Heuglin *d 1*; Salvadori *d 9*, *d 21*; Legge *d 6*; Taczanowski *16*; Sharpe *d 25*; etc.

The above are, according to our usual plan in such cases, for the most part references to a few general works and especially to papers on the birds of Celebes and the East Indies.

Figures and descriptions. Naumann *III*; Gould *c II*; Dresser *b II*; Meyer *d XXII* (skeleton); Seebohm *b 4*; Legge *d 6*; Salvad. *d 9*; Oates *d 11*; Taczanowski *16*; Sharpe *d 25*; etc., etc.

Adult. Above drab, with a strong bronze gloss, the feathers with darker shaft-lines and on the back with slight bars; the tertiaries, upper tail-coverts and tail-feathers notched with dark and pale brown, extending as bars across the upper wing-coverts; the tail-feathers paling into white laterally, with irregular brown bars; remiges dusky, crossed with a broad white bar extending across secondaries and on to inner webs of primaries (except the outermost one); supraloral stripe white, lores brown; ear-coverts and sides of breast drab, like the head; chin, throat and under-parts white, edge of wing below barred with brown; "iris dark brown; bill dark brownish grey, blackish toward tip, reddish at base of lower mandible; feet light grey, with a faint tinge of yellowish green": Stejneger *12* (Minahassa: Faber — C 3531; ♀, Kema, 8. Oct. 93: P. & F. Sarasin).

Female. Like the male, but somewhat smaller, and somewhat more simply coloured in respect of the markings on the upper parts (from Naumann *III*).

Winter plumage. "Differs from the summer dress in being more uniform and much less marked with black above, and in having the throat and breast greyer and more striped" (Dresser *b II*).

Bird of the year. Differs from the adults in having the dark bars of the upper parts

much broader; the secondaries somewhat more extensively white (one of the innermost being entirely white), but no white on the second primary; the sides of the breast and jugulum more extensively striated with dark brown; "legs and feet slaty greenish, toes dusky": Legge *d 6* (Kabruang, 8. Nov. 93: Nat. Coll. — C 13052).

Measurements (27 examples from Celebes and the neighbouring islands). Wing 100—117 mm; tarsus ca. 24—27; mid. toe with claw ca. 24; tail ca. 54; bill ca. 23—26.

Moult. Two specimens killed in the Minahassa in January (Nat. Coll.), three in March (Meyer) and one in July from Limbotto are moulting their remiges.

Skeleton.

Length of cranium . . .	49.0 mm	Length of fibula	18.4 mm
Greatest breadth of cranium	13.5 »	Length of tarso-metatarsus	24.0 »
Length of humerus . . .	28.6 »	Length of sternum . . .	32.0 »
Length of ulna	29.5 »	Greatest breadth of sternum	14.0 »
Length of radius	28.3 »	Height of crista sterni . .	11.5 »
Length of manus	33.4 »	Length of pelvis	31.4 »
Length of femur	24.0 »	Greatest breadth of pelvis .	17.0 »
Length of tibia	39.3 »		

Eggs. 4; pyriform; white, with the faintest possible tinge of green, to pale creamy buff, speckled, spotted and blotched with light and dark reddish brown, and with underlying markings of inky grey, size 35.5—40.6 × 25.4—28.7 mm (from Seebohm *b 3*).

Nest. Usually near the water: on sandy banks, where coarse grass is growing; or amongst herbage on the higher land; or on sand and gravel strewed with large stones and tufts of herbage; in woods on the banks of a river; even in gardens, orchards, or turnip-fields. The nest — a little hollow scratched in the ground, lined with a few bits of dry grass, scraps of heather, dry leaves, or bits of withered rush (from Seebohm *b 3*).

Distribution. Europe; Africa; Madagascar; Asia; throughout the East India Islands to Australia and Tasmania and N. W. Polynesia. — Celebes Province: Talaut Is. — Kabruang (Nat. Coll.); Great Sangi (Meyer *d 13*, Bruijn *d 3*); Siao (Meyer *d 13*); Manado tua and Mantehage (Nat. Coll.); Minahassa (Meyer, Guillemard *d 15*, P. & F. Sarasin *b 12*, etc.); Gorontalo Distr. (Forsten *4*, Meyer *10*, Rosenb. *11*, etc.); Togian (Meyer *10*); Lake Posso (P. & F. Sarasin *17*); Tete Adji, South Penins. (Weber *b 9*); Saleyer (Weber *b 9*).

The Common Sandpiper ranges from the arctic shores of Europe to the Cape of Good Hope, from Kamtschatka to Tasmania, from Ireland in the west to Japan in the east; it is found alike on the strand of the Elbe at Dresden and of the Bay of Manado, Celebes. It is not known, however, in America, nor in New Zealand, being represented in the New World by *Actitis macularia* (L.) in which, when adult and in breeding plumage, the under-parts are spotted with blackish. The legs of the latter are yellower, which with some other small differences may serve to distinguish it in winter and when younger.

In the northern parts of its range the Common Sandpiper is only a summer visitor, migrating southward in autumn. In Celebes it is to some extent a resident, as shown by specimens collected by Meyer at Limbotto in July and August and at Togian in August, but its numbers are probably greatly increased by migrants from the north in winter. In Borneo, where it is fairly common, according to Whitehead, some also apparently remain throughout the year.

It is resident in China according to David and Styan, in Formosa according to Swinhoe, and Hume records its breeding in N. W. India. There is no evidence as yet that it ever breeds in Celebes.

The genus *Actitis* may be described as intermediate between *Totanus* and *Tringa*. It has the bill much as in the latter genus, the foot as in the former. The maxillary groove, in which the nostril is situated, is continued almost to the tip of the bill, or fully seven-eights of its length, while in *Totanus* the maxilla is round and solid at the sides for almost the terminal half of its length before the groove commences. A small web is found at the base of the middle and outer toes of *Actitis*, whereas in *Tringa* the toes are free. The white bar across the remiges of *Actitis*, very conspicuous when the bird is in flight, easily distinguishes it from both these allied genera. Some anatomical differences, such as a modification in the sternum, are further pointed out by Nitzsch.

GENUS TEREKIA Bp.

Differs from *Totanus* in having the tarsus much shorter than the bill, in having the maxillary groove traceable almost to the end of the bill, and by the absence of white on the tail and rump; from *Actitis* it differs chiefly by its long recurved bill, and there is a small basal web connecting the inner, as well as the outer toe, with the middle one. Migratory; the single species is found from E. Europe and Asia south to Australia and S. Africa.

330. TEREKIA CINEREA (Güld.).

Terek Sandpiper.

a. **Scolopax cinerea** *(I)* Güldenst., N. Comm. Petrov. XIX, 473, pl. XXI (1774).
b. **Totanus javanicus** *(1)* Horsf., Tr. L. S. 1821, XIII, 193.
c. **Scolopax sumatrana** *(1)* Rfl., Tr. L. S. 1822, XIII, 327.
d. **Limosa terek** Temm. *(I)* Gld., B. Europe IV, pl. 307 (1837).
Terekia cinerea *(1)* Less., Compl. de Buff. Ois. 1838, 679; *(II)* Gld., B. Austr. 1848, VI, pl. 34; *(3)* id., Hb. B. Austr. 1865, II, 261; *(IV)* Sh. & Dress., B. Europe 1871, VIII, 195, pl. 572; *(5)* Salvad., Cat. Ucc. Borneo 1874, 330; *(6)* Hume, Str. F. 1874, II, 296; *(7)* Hartl., Vög. Madag. 1877, 325; *(8)* David & Oust., Ois. Chine 1877, 460; *(9)* Hume & Davis., Str. F. 1878, VI, 460; *(10)* Tweedd., P. Z. S. 1878, 711; *(11)* Hume, Str. F. 1879, VIII, 70; *(12)* Milne-Ed. & Grandid., Ois. Madag. 1879, I, 629; *(13)* Legge, B. Ceylon 1880, 836; *(14)* Salvad., Orn. Pap. 1882, III, 326; *(15)* Oates, B. Brit. Burmah 1883, II, 407; *(16)* Meyer, Isis, Dresden 1884, 55; *(16bis)* Vorderm., N. T. Ned. Ind. 1884, XLIII, 116; *(17)* Stejn., Bull. U. S. Nat. Mus. 1885, Nr. 29, p. 132; *(18)* Sharpe, Ibis 1886, 492; *(19)* W. Blas., Z. ges. Orn. 1886, 166; *(19bis)* Meves, Ornis 1886, 255; *(20)* Stejn., Pr. U. S. Nat. Mus. 1887, 133; *(21)* Sharpe, Ibis 1888, 203; *(22)* Everett, J. Str. Br. R. A. S. 1889, 209; *(23)* Rad. & Walt., Ornis 1889, 119; *(24)* Whitehd., Ibis 1890, 59; *(25)* Steere, List Coll. B. & M. Philipp. 1890, 26; *(26)* Sharpe, Ibis 1891, 114; *(27)* Styan, t. c. 331, 507; *(28)* Salvad., Orn. Pap. Agg. 1891, 203; *(29)* De La Touche,

Ibis 1892, 500; *(30)* Barnes, Ibis 1893, 171; *(31)* Tacz., Faun. Orn. Sib. Orient. 1893, II, 856; *(32)* Bns. & Worces., B. Menage Exped. 1894, 31; *(33)* Yerbury, Ibis 1896, 35; *(34)* Sharpe, Cat. B. 1896, XXIV, 474.

e. **Limosa cinerea** *(1)* Gray, Gen. B. III, 570 (1847); *(2)* Heugl., Vög. N. O. Afr. 1871, II, 1157.

f. **Totanus cinereus** *(1)* Schl., Mus. P.-B., Scolopaces, 1864, 77; *(2)* Büttik., Zool. Erg. Weber's Reise 1893, III, 283.

g. **Totanus terekius** *(1)* Seeb., Distr. Charadr. 1887, 369; *(2)* id., B. Japan 1890, 326.

h. **Tringa (Terekia) cinerea** *(1)* Rams., Tab. List 1888, 20.

i. **Totanus calidris** err. *(1)* M. & Wg., (nec L.), Abh. Mus. Dresd. 1895, Nr. 8, p. 18.

For further synonymy and references cf. Heuglin *e 2*; Salvadori *14* (excl. *Terekia guttifera*); Legge *13*; Taczanowski *31*; Sharpe *34*.

Figures and descriptions. Gould *d I, II*; Sharpe & Dresser *IV*; Hartlaub *7*; David & Oust. *8*; Legge *13*; Salvadori *14*; Oates *15*; Vorderman *16bis*; Seebohm *g 1* (diagn.); Taczanowski *31*; Sharpe *34*.

Winter plumage. Above drab, the feathers with blackish shaft-streaks, some of the scapulars blackish, outer tail-feathers whitish grey with a darker submarginal border; remiges, lesser and metacarpal wing-coverts darker brown than the back, shaft of first quill white, the second whitish, the rest brown; secondaries broadly (about 1 cm) tipped with white, greater wing-coverts narrowly tipped with white; forehead and face white, marked on lores and cheeks with dark streaks; entire under-parts white, a few dark streaks on jugulum; edge of wing below brown, with white tips and edgings; bill strongly recurved (Minahassa: v. Faber — C 3540).

A second specimen from Celebes which from its smaller bill seems to be young is like that described, but more thickly striated with brown on the fore-neck and sides of breast; "bill black, at base yellowish; feet yellowish; iris dark" (♂, Kema, 14. Sept. 1892: P.& F. Sarasin).

Sexes. Not known to differ in coloration.

Breeding plumage. The black shaft-streaks of the upper surface are broader, occupying more of the feather.

Young. The young bird scarcely able to fly is very like the adult, but the inner wing-coverts, scapulars, and tertiaries are tipped with dull dark cinnamon, and the breast is clouded with grey-brown with dark shaft-streaks (Nr. 11442).

Measurements.	Wing	Tail	Tarsus	Mid. toe with claw	Exposed Culmen (straight)
a. (C 3540) ad., Minahassa, 1877 (Faber). . .	132	49	30	25	52
b. (Sarasin Coll.) ♂ (juv.?), Kema, 14. IX. 92	129	52	28	23	46

Eggs. 4 in number *(31)*; pear-shaped; Sandpiper-like, not resembling *Limosa*-eggs; ground-colour dull buff, the markings light purplish grey and dark purplish brown; size 35.6—39.4 × 25.4—27.4 (Sh. & Dr. *IV*, Legge *13*).

Nest. In North Russia: "A slight depression in the ground, about four inches in diameter, on small bits of rotten wood, pieces of reed, and but seldom leaves, behind a small knot of drift wood, a root, or a slightly elevated piece of ground" (Hoffmannsegg and Henke in Sharpe & Dresser *IV*).

Distribution. Europe, principally East (Sh. & Dresser *IV*); South Africa (Ayres *IV, 13*); Madagascar and Mauritius (Hartlaub *7*); Asia, through the East Indies, to Australia: — Siberia (Pallas, Middendorff, etc. *31*); Bering Id. (Stejneger *17, 20*); Sakhalien (Nikolski *31*), Japan (Pryer & Ouston *g 2*); China (Swinhoe, David,

etc. *8, 14, 29*); India (Jerdon, etc. *13*); Ceylon (Holdsworth *13*); Andamans (Hume & Davison *6*); Burmah (Oates etc. *15*); Tenasserim (Davison *9*); Malay Peninsula (Hume *11*); Sumatra (Raffles *c 1*); Java (Horsfield *b 1, 34*, Kuhl & v. Hasselt *f 1*, Vorderman *16bis*); Borneo (Doria & Beccari *22*, Everett *34*); Philippines — Palawan (Whitehead *21, 24*), Bohol (Everett *10*), Negros (Steere *25*), Masbate (Bourns & Worcester *32*); Celebes — Gorontalo Distr. (Riedel *19*), Minahassa (Faber, P. & F. Sarasin *i 1*), Luwu (Weber *f 2*); Moluccas — Morty and Halmahera (Bernstein *f 1, 14*); Ceram (Riedel *16, 28*); Australia — Queensland and N. S. Wales (Gould *II*, Ramsay *h 1*).

The Terek Sandpiper is known to breed in North Russia and in North Siberia, in the latter country on the banks of the Wilui, a tributary of the Lena *(31)*. In S. E. Siberia, Sakhalien and Bering Id. it is known only as a migrant; on the south shores of the Sea of Ochotsk von Middendorff observed it through the summer in flocks composed chiefly of females, but they were not breeding. In China and Japan it seems to be a bird of passage *(8, 27, 29, g 2)*. It winters in some abundance in Pegu and in the Andamans *(15, 6)*, but in 1880 Legge knew of only one specimen killed in Ceylon, though Dr. Sharpe *(34)* records a second in the British Museum. In the East India Islands few specimens have been obtained, though Bernstein met with some success in finding it in September and November, 1861, in Halmahera and Morty, as shown by seven specimens in the Leyden Museum collected by him.

As to Celebes in 1886 W. Blasius placed on record an unlabelled specimen to all appearance collected by Riedel in the Gorontalo District in 1866—1867. Weber got four examples from Luwu in February, 1889, as shown by Büttikofer; and two from the Minahassa, one obtained by Faber and the other by the Sarasins, are described above.

The Terek Sandpiper, the type of the genus *Terekia*, seems to have its nearest affinities with *Actitis*, and might be described as an *Actitis* with a long drawn-out and recurved bill. Its toes are also more webbed, the outer toe being connected up to the first joint, the inner toe about $^2/_3$ as far; it is said to swim and dive well when wounded. It wants the white bar across the remiges seen in *Actitis*, but has the terminal part for one centimeter and much of the inner webs of the secondaries white. As to its haunts Meves remarks that it might almost be called the River-sandpiper. Its habits are well described by this writer, by Hoffmannsegg and Henke, and by Liljeborg in Sharpe and Dresser *(IV)*.

GENUS TRINGA L.

These are small *Limicolae*, with a soft Snipe-like bill, but only about as long as the tarsus or less, and the toes webless (cleft to their base). The nasal groove extends into the terminal third of the bill, which is slightly widened at the tip; a small hallux is present; the middle toe with claw is about as long

as the tarsus, when not less; tail somewhat short, square to pointed, 12 rectrices. No white on the tail or rump. Migratory; almost cosmopolitan.

331. TRINGA ACUMINATA (Horsf.).

Sharp-tailed Sandpiper.

a. **Totanus acuminatus** *(1)* Horsf., Tr. L. S. 1821, XIII, 192.

b. **Tringa australis** *(I)* Jard. & Selby, Ill. Orn. II, pl. 91 (1829); *(2)* Hartert, Kat. Vog. Slg. Senckenb. Mus. 1891, 221.

c. **Schoeniclus australis** *(I)* Gould, B. Austr. 1848, VI, pl. 30.

Tringa acuminata *(1)* Swinh., P. Z. S. 1863, 316; *(2)* id., Ibis 1863, 412; *(3)* Schl., Mus. P.-B., Scolopaces, 1864, 38; *(4)* Meyer, J. f. O. 1873, 405; *(5)* Finsch, ib. 1874, 172, 197; *(6)* David & Oust., Ois. Chine 1877, 470; *(7)* Meyer, Ibis 1879, 143; *(8)* Rosenb., Zool. Garten 1881, 167; *(9)* Bidd., Ibis 1882, 266, 287; *(10)* id., Str. F. 1882, X, 276; *(11)* Salvad., Orn. Pap. 1882, III, 313; *(12)* W. Blas., J. f. O. 1883, 118, 150; *(13)* Meyer, ib. 150; *(14)* Guillem., P. Z. S. 1885, 664; *(15)* Seeb., Distr. Charadr. 1887, 441; *(XVI)* Nelson, Rep. N. H. Coll. Alaska 1887, 106, pl. VII; *(17)* Buller, B. New Zeal. 2nd ed. 1888, II, 37; *(18)* Rams., Tab. List 1888, 20; *(19)* Tacz., P. Z. S. 1888, 457; *(20)* Sclat., Ibis 1889, 249; *(21)* Seeb., B. Japan 1890, 339; *(22)* Styan, Ibis 1891, 330, 506; *(23)* Salvad., Orn. Pap. Agg. 1891, 201; *(24)* De La Touche, Ibis 1892, 499; *(25)* Sclat., P. Z. S. 1892, 581; *(26)* Wiglesw., Av. Polyn. 1892, 64; *(27)* Ribbe, Jb. Ver. Erdk. Dresden 1892, 172; *(XXVIII)* Seeb., Ibis 1893, 120, 181, pl. V; *(29)* Sclat., ib. 183; *(30)* Tacz., Faun. Orn. Sib. Orient. 1893, II, 906; *(XXXI)* Dresser, B. Europe, Suppl. 1896, pl. 712.

d. **Limnocinclus acuminatus** *(1)* Gould, Hb. B. Austr. 1865, II, 254; *(2)* Tweedd., P. Z. S. 1877, 834.

e. **Pelidna acuminata** *(1)* Salvad., Cat. Ucc. Borneo 1874, 320.

f. **Actodromas acuminatus** *(1)* Ridgw., Pr. U. S. Nat. Mus. 1881, III, 199, 222; *(1bis)* Nelson, Cruise "Corwin" 1881, 86; *(2)* Baird, Brew. & Ridgw., Water B. N. Am. 1884, I, 225, 235; *(3)* Stejn., Bull. U. S. Nat. Mus. Nr. 29, 1885, p. 115; *(4)* id., Pr. U. S. Nat. Mus. 1887, X, 130.

g. **Heteropygia acuminata** *(1)* Sharpe, Cat. B. 1896, XXIV, 566, 767.

For further synonymy and references cf. Salvadori *11, 23*; Sclater *29*; Taczanowski *30*; Sharpe *g 1.*

Figures and descriptions. Gould *c I, d 1*; Nelson *XVI*; Seebohm *XXVIII, 15* (tail); Jardine & Selby *b I*; Dresser *XXXI*; David & Oustalet *6*; Salvadori *11*; Baird, Brewer and Ridgway *f 2*; Buller *17*; Taczanowski *30*; Sharpe *g 1.*

Adult. Above broccoli-brown, the centres of the feathers black; head above yellower brown (inclining to tawny-olive) with black centres; wings darker brown, the coverts with whitish edgings, broadest at the tips of the greater series; shafts of remiges white for the terminal half (except at tip), brownish in basal half, below all white; rump and upper tail-coverts mesially deep brown, with reddish brown tips, at the sides white; tail-feathers narrowed towards tip, deep brown, edged and tipped with cinnamon, the lateral ones greyer brown, with white edgings; superciliary stripe and sides of head whitish, with a buff tint on jugulum and sides of neck, more drab on upper breast, the whole with fine striations and spots of dark brown; chin and upper throat white, unspotted; remaining under-parts white, sparingly

streaked with brown on sides, flanks and under tail-coverts; under wing-coverts white, mottled with brown and white against metacarpal edge; bill blackish brown, paler at base of lower mandible; "feet ochre-yellow, tinged with olive, and with darker joints; iris dark brown" (Stejneger *f 3*); wing 127 mm; tail 50; tarsus 29; mid. toe with claw 26.5; exposed culmen ca. 24 (Limbotto: Meyer — C 1940).

The specimen described is most likely a female. Taczanowski describes the female as having the russet on the top of the head less bright, the spots here and on the neck and breast less intense, the middle of the breast largely unspotted.

Young. It is described as having the upper-parts bright rusty ochraceous (not brownish grey) with black centre-streaks, the under-parts tinted with isabelline, the striations fewer and smaller.

? Eggs. Taczanowski *(30)* quotes without comment a description by Meves of the eggs (of this species?), but mentions, like Seebohm, that nothing of its nidification is known.

Distribution. East Siberia (Middend. etc. *30*); Bering Id. (Stejneger *f 3*); Alaska (Nelson *f 1, XVI, 20*); Corea (Kalinowski *19*); Japan (Blakiston, etc. *21*); China (Swinh. *1*, David *6*, etc.); Formosa (Swinh. *2*); India — Gilgit (Biddulph *9, 10*); Philippines — Mindanao (Everett *d 2*); North Celebes — Limbotto (Rosenb. *8*, Meyer *4, 7, 13*); Java (Horsfield *a 1*, de Vriese *3*); Ternate, Amboina, Ceram, Waigiou, Salawatti, Aru, New Guinea (cf. Salvad. *11, 23*); Australia and Tasmania (cf. Ramsay *18*); Pelew Is. (Tetens *26*); New Caledonia (Marie *26*); New Zealand (Buller *17*). Has occurred in Europe: England (Ground *XXVIII*).

This far-ranging traveller was first recorded from Celebes by Meyer, who got it at Lake Limbotto, curiously enough in July *(7)*, affording another instance, apparently, of birds staying out of the general migration. If Rosenberg's *(8)* identification is correct, four examples were previously obtained by him at the same spot.

The breeding grounds of the Sharp-tailed Sandpiper are as yet unknown; probably they lie in parts of the east and north of Siberia and the arctic islands still further north. Middendorff saw it on the south shore of the Sea of Ochotsk in July, but in Bering Island Stejneger obtained it only during the autumnal migration of 1882. It is known in China from the observations of David, Styan and De La Touche as a bird which passes by on migration; such it is, too, according to Seebohm, in Japan. The migration probably passes on through the East Indies to Australia, though the absence of records from Borneo and Sumatra and the rarity of specimens from Celebes, Java and the Philippines (as yet, apparently, there is one example from Mindanao only) may possibly be due to the main body of the migrants holding a more eastern course across the Pacific, a view which the occurrence of the bird in the Pelew Islands and New Zealand seems to support.

Far away from its proper territories a single adult individual was shot in 1892 on Breydon mudflats, Norfolk, by Mr. T. Ground, who found it in company with a Ringed Plover and three or four Dunlins. The only specimen as yet recorded from the Indian countries was killed in Gilgit by Major Biddulph; it was flying with a number of Ruffs *(Machetes pugnax)*.

The Sharp-tailed Sandpiper is most similar to *T. pectoralis* (Say) of America, which differs in having a slightly longer bill, the middle tail-feathers 6.3 mm longer than the next pair (as against 2.5 mm in *acuminata*), the belly and under tail-coverts pure white in summer, and some other characters carefully pointed out by Seebohm, who allows the American bird only subspecific rank. From other *Tringae* occurring in Celebes, *T. acuminata* is easily distinguished from *T. albescens* and *damascensis* by its much larger size. *T. crassirostris* T. & S., which is almost sure to be found in Celebes sooner or later, is very much larger (wing 178—193 mm) than *acuminata* and has the bill longer than the head. The Common Sandpiper may be easily distinguished by the two white bars across its wing, and the green-glossed drab colour of its upper surface, the upper parts of *acuminata* resembling those of a Lark.

332. TRINGA DAMASCENSIS (Horsf.).

Long-toed Stint.

a. **Totanus damascensis** *(1)* Horsf., Tr. Linn. Soc. 1821, XIII, 192.[1])

b. **Tringa minuta** *(1)* Blyth (nec Leisl.), Cat. B. Mus. A. S. B. 1849, 270.

c. **Tringa subminuta** *(1)* Midd., Sibir. Reise II, pt. 2, 1853, p. 222, t. XIX, f. 6 (foot); *(2)* Schrenck, Reise Amurl. I, pt. 2, 1860, 424; *(3)* Prjev., Rowl. Orn. Misc. 1878, III, 90; *(4)* Legge, B. Ceylon 1880, 889; *(5)* Oates, B. Brit. Burmah 1883, II, 391; *(6)* Seeb., Ibis 1884, 34; *(7)* id., Distr. Charadr. 1887, 438; *(8)* Tacz., P. Z. S. 1888, 457; *(9)* W. Blas., Ornis 1888, 319; *(10)* Everett, J. Str. Br. R. A. S. 1889, 207; *(11)* Sharpe, Ibis 1890, 143; *(12)* Seeb., B. Japan 1890, 338; *(13)* Styan, Ibis 1891, 506; *(14)* De La Touche, Ibis 1892, 499; *(15)* Tacz., Faun. Orn. Sib. Orient. 1893, II, 941; *(16)* Styan, Ibis 1894, 335.

d. **Actodromas subminuta** *(1)* Bp., C. R. 1856, XLIII, 596, Nr. 218.

Tringa damascensis *(1)* Swinh., P. Z. S. 1863, 316; *(2)* id., Ibis 1863, 413; *(3)* id., Ibis 1864, 420; *(4)* Schl., Mus. P.-B., Scolopaces, 1864, 48; *(5)* Blyth, Ibis 1865, 34; *(6)* Swinh., P. Z. S. 1871, 409; *(7)* Wald., Tr. Z. S. 1872, VIII, 97; *(8)* Hume, Str. F. 1873, I, 243; *(9)* id., ib. 1874, II, 482; *(10)* id., ib. 1875, III, 182; *(11)* Ball, ib. 1878, VII, 228; *(12)* Rosenb., Malay. Archip. 1878, 278; *(13)* W. Blas., J. f. O. 1883, 127; *(14)* Vorderm., N. T. Ned. Ind. 1883, XLII, 98.

e. **Tringa salina** (nec Pall.); *(1)* Sh. & Dress., B. Europe VII, 33 (1871); *(2)* Hume, Str. F. 1873, I, 242; *(3)* Legge, t. c. 491; *(4)* id., ib. 1875, III, 265.

f. **Actodromas salina** (nec Pall.); *(1)* Salvad., Cat. Ucc. Borneo 1874, 324.

g. **Tringa ruficollis** (nec Pall.); *(1)* Wald., Tr. Z. S. 1875, IX, 234; *(2)* Hume, Str. F. 1878, VI, 461; *(3)* id., ib. 1878, VII, 228, 487; *(4)* id., ib. 1879, VIII, 70, 157; *(5)* Seeb., Ibis 1879, 26; *(6)* Oates, Str. F. X, 1882, 240; *(7)* Hume, ib. 1888, XI, 323.

h. **Actodromas damascensis** *(1)* Stejn., Bull. U. S. Nat. Mus. 1885, Nr. 29, p. 116; *(2)* id., Pr. U. S. Nat. Mus. 1887, 130.

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[1]) It would be impossible to identify this bird after Horsfield's description with the carefully diagnosed *Tringa subminuta* of von Middendorff with any feeling of security, had not Blyth, who seems to have examined Horsfield's type, stated that they are identical (Ibis 1865, 34). So, too, more recently Sharpe (Cat. B. 1896, XXIV, 553, 555).

i. **Limonites damacensis** *(1)* Sharpe, Cat. B. 1896, XXIV, 553, 767.

For further references cf. Legge *c 4*; Stejneger *h 1*; Taczanowski *c 15*; Sharpe *i 1*.

Descriptions. Middendorff *c I* (fig. of foot); Legge *c 4*; Oates *c 5*; Vorderman *14*; Stejneger *h 1* (diagn.); Seebohm *c 7* (diagn.); Taczanowski *c 15*; Sharpe *i 1*.

Winter plumage. Above broccoli-brown (grey-brown), varied with blackish brown centres to the feathers; rump and upper tail-coverts nearly black, at sides white; wing-coverts dark brown, the inner ones broccoli-brown, the greater series narrowly tipped with white; remiges dusky, the outermost primary with a whitish shaft, the rest with brown shafts (underneath white); superciliary and subocular regions whitish, striolated with brown; lores and ear-coverts browner; jugulum and breast whitish, browner at sides and finely streaked with darker brown, clear on chin and middle of throat; remaining under-parts white, varied with grey-brown at the sides, with dark brown and white on metacarpal under wing-coverts; "iris dark brown; bill blackish, olive-brown at base of lower jaw; feet greyish yellow, with joints darker olive" (Stejneger *h 1*); wing 90 mm; tail 39; tarsus 24.5; mid. toe with claw 25; exposed culmen 18 (N. Celebes: Faber — C 3535).

Summer plumage. In summer the grey-brown borders of winter plumage on the upper parts are replaced with rufous; the feathers of the hind neck are broadly bordered with buff, a wash of buff on jugulum, no ferruginous on fore neck and breast.

Measurements. Wing 87—92 mm; tail 34—41; bill 17—20; tarsus 21—22; mid. toe with claw 21.5—25.5 (from Taczanowski *c 15*).

Eggs. Unknown.

Distribution. Bering Id. (Stejneger *h 1*); N. E. Siberia (Middend. *c I*); Amurland (Maack, etc. *c 2*, *c 15*); Baikal (Dyb. & Godl. *c 15*); S. E. Mongolia (Prjevalsky *c 3*); Corea (Kalin. *c 8*, *c 15*); Sakhalien (Nikolski *c 15*); Kurile Is. (Snow *c 12*); Japan (Blakiston, etc. *c 12*); China (Swinhoe *1*, *6*, etc.); Formosa (Swinhoe *2*); India (Hume, etc. *c 4*, *g 7*); Ceylon (Legge, etc. *c 4*); Burmah (Oates *c 5*); Tenasserim (Davison *g 2*); Malay Peninsula (Hume *g 4*); Philippines — Luzon (Meyer *g 1*), Palawan (Platen *c 9*); Borneo (Schwaner *4*, Everett *c 10*, Whitehead *c 11*); Banka (v. d. Bossche *4*); Java (Horsfield *a 1*, Boie *4*, etc.); N. Celebes — Minahassa (Forsten *4*, Faber in Dresd. Mus.), Gorontalo Distr. (Forsten *4*).

The Long-toed Stint is a winter visitor to Celebes, perhaps only an irregular one. Its nidification is as yet unknown, but in Bering Island Dr. Stejneger found that, while most of the birds stay only a few days, going further north, a small number remain over summer, breeding sparingly on the large swamp behind the village; he did not, however, succeed in finding their nests. Nikolski says that it certainly breeds in Sakhalien, and von Middendorff killed it near the mouth of the Uda (Sea of Ochotsk) on June 30th. Its winter haunts seem to be Pegu, Ceylon, parts of India, probably the Siamese and Malay Peninsulas, and the East Indies as far as Celebes, east of which it is not as yet known.

T. damascensis may be easily distinguished from the Eastern Little Stint, *T. ruficollis* Pall., by its much longer toes, which are yellowish in colour, not black; by the shafts of its primaries being (except the outermost) brown, not white above; by the broad blackish centres to the feathers of the upper surface in winter, as against the greyer tint with dark shaft-streaks of *ruficollis*; and in summer plumage by the absence on the throat and jugulum of the ferruginous

seen in *ruficollis*. *T. temmincki*, which may ultimately be found in Celebes, has similar brown-shafted primaries, except the first which is pure white, and may be distinguished by its short toes, black in colour. Several writers have tried to shift Pallas' name *ruficollis* and his other name *sabina* on to the Long-toed Stint — a most unwarrantable proceeding, since that bird is described as having black feet, a ferruginous fore-neck, and white shafts to the remiges (except 2—4), and it is certainly the eastern form of *T. minuta* in breeding plumage.

333. TRINGA RUFICOLLIS Pall.

East Siberian Little Stint.

a. **Trynga ruficollis** *(1)* Pallas, Reis. Russ. Reichs 1776, III, 700.

b. **Red-necked Purre** *(1)* Lath., Syn. 1783, III, 1, p. 183.

Tringa ruficollis *(1)* Gm., S. N. 1788, I, 680; *(2)* Wald., Ibis 1873, 317; *(3)* David & Oust., Ois. Chine 1877, 472 (excl. syn.); *(4)* Legge, B. Ceylon 1880, 885; *(5)* Seeb., Ibis 1884, 34, 268; *(6)* Sharpe, Ibis 1888, 203; *(7)* Everett, J. Str. Br. R. A. S. 1889, 207; *(8)* Whitehd., Ibis 1890, 59; *(9)* Sharpe, t. c. 143; *(10)* Campb., Ibis 1892, 246; *(11)* De La Touche, t. c. 499; *(12)* Styan, Ibis 1893, 437; *(13)* Tacz., Faun. Orn. Sib. Orient. 1893, II, 920; *(14)* Bourns & Worces., B. Menage Exped. 1894, 31; *(15)* Newton, Nature 1895, vol 52, 438; *(16)* Hart., Nov. Zool. 1896, 180.

c. **Trynga salina** *(1)* Pall., Zoogr. Rosso. Asiat. 1811, II, 199, tab. LXI.

d. **Tringa albescens** *(1)* Temm., Pl. Col. pl. 41, fig. 2 (1824); ?*(2)* Wald., Ibis 1873, 317; *(3)* Legge, Str. F. 1875, III, 265; *(4)* Hume, ib. 1876, IV, 343; *(5)* Tweedd., P. Z. S. 1878, 712; *(6)* Hume, Str. F. 1879, VIII, 157; *(7)* Collett, J. f. O. 1881, 328; *(8)* Salvad., Orn. Pap. 1882, III, 315; *(9)* Oates, B. Brit. Burmah 1883, II, 392; *(10)* Meyer, Isis, Dresden 1884, 6, 55; *(11)* Guillem., P. Z. S. 1885, 417, 576; *(12)* W. Blas., Ibis 1888, 374; *(13)* id., Ornis 1888, 319, 627; *(14)* Rams., Tab. List 1888, 20; *(15)* Salvad., Orn. Pap. Agg. 1891, 201; *(16)* Wiglesw., Av. Polyn. 1892, 64; *(17)* Salvad., Ann. Mus. Civ. Gen. 1896, (2) XVI, 118.

e. **Tringa australis** *(1)* Less., Tr. d'Orn. 1831, 558 (ex Cuvier).

f. **Tringa minuta** (nec Leisl.); *(1)* Gould, B. Europe 1837, IV, pl. 332 middle fig. only (fide Legge *4*); *(2)* Midd., Sibir. Reise 1853, II, pt. 2, p. 221 (partim apud Tacz. *13*); *(3)* Schl., Mus. P.-B., Scolopaces, 1864, 43, pt.; *(4)* Wald., Tr. Z. S. 1872, VIII, 97; *(5)* Hume, Str. F. 1873, I, 243; ?*(6)* id., ib. 1874, II, 298; *(6bis)* Lenz, J. f. O. 1877, 380; *(7)* Rosenberg, Malay. Archip. 1878, 278; *(8)* Meyer, Ibis 1879, 143; *(9)* Rosenb., Zool. Garten 1881, 167; *(10)* Steere, List Coll. B. & M. Philipp. 1890, 26; *(11)* Seeb., B. Japan 1890, 337; *(12)* Büttik., Notes Leyd. Mus. 1892, 204; *(13)* id., Zool. Erg. Weber's Reise 1893, III, 306.

g. **Schoeniclus albescens** *(1)* Gould, B. Austr. 1848, VI, pl. 31.

h. **Actodromas albescens** *(1)* Bp., Compt. Rend. 1856, XLIII, 596, n. 220; *(2)* Salvadori, Cat. Ucc. Borneo 1874, 323.

i. **Actodromas australis** *(1)* Bp., C. R. 1856, XLIII, 596, n. 221; *(2)* Gld., Hb. B. Austr. 1865, II, 257.

j. **Tringa salina** *(1)* Swinh., Ibis 1873, 231.

k. **Actodromas ruficollis** *(1)* Stejn., Bull. U. S. Nat. Mus. 1885, Nr. 29, 118; *(2)* id., Proc. U. S. Nat. Mus. 1887, X, 130.

l. **Tringa minuta ruficollis** *(1)* Seeb., Distr. Charadr. 1887, 437, pl. XV.

m. **Limonites ruficollis** *(1)* Sharpe, Cat. B. 1896, XXIV, 545, 767.

For further references cf. Salvad. *d 8*; Stejneger *k 1*; Taczanowski *13*; Sharpe *m 1*.

Figures and descriptions. Gould *f I*, *g I*; Seebohm *l I*; Pallas *c I*; Temminck *d I*; Salvadori *d 8*; Stejneger *k 1* (diagn.); Taczanowski *13*; Sharpe *m 1*.

Winter plumage. Above drab, with dark brown centre-streaks on head above, back, scapulars and wing-coverts; rump and upper tail-coverts blacker, white at the sides; tail dark brown, paling into grey on the lateral feathers; outer upper wing-coverts dark brown, the greater series tipped with white; remiges dark brown, shafts white (only partly so on 2nd to 4th primaries), the inner primaries and the secondaries edged with white, increasing in extent inwardly so as to absorb almost all of the inner secondaries; tertiaries dark brown; lores and ear-coverts brownish; supraloral and superciliary region, cheeks and entire under-parts white; under wing-coverts white, barred with brown at edge of wing; "iris brown, bill and feet black": Guillem. *d 11* (Timor: Riedel — C 6288).

Summer plumage. The feathers of the upper-parts with black centres broadly edged with ferruginous; cheeks, fore-neck and jugulum ferruginous, sides of breast with short streaks of dark brown, the rest as in winter (♀, Rubi, New Guinea, May 1873: Meyer — C 910).

Remark. A specimen from Great Sangi (C 7560) is in almost complete winter dress with some remains of summer plumage on the upper parts; while C 910 and another killed at Rubi at the same time are in incomplete summer plumage, with remains of winter plumage.

Measurements.	Wing	Tail	Tarsus	Middle toe with claw	Exposed culmen
a. (C 7650) Gt. Sangi (Meyer)	101	44	21	18	18
b. (C 1941) ♀, Limbotto, Celebes, July, 71 (id.)	108	46	20.5	—	—
c. (C 5418) ♂, N. Bohol, Nov. 1877 (Everett)	98	45	19	17.5	17
d. (C 5424) ♀, N. Bohol, Nov. 1877 (Everett)	100	45	20	18	19
e. (C 6289) Timor (Riedel)	94	43	19.5	17.5	17.5
f. (C 6288) Timor (id.)	103	44	20.5	18.5	19
g. (C 910) ♀, New Guinea, June, 73 (Meyer)	105	45	20.5	18.5	—
h. (C 908) ♂, New Guinea, June, 73 (id.)	103	44	19.5	19	17

Eggs and nest? On the Taimyr River (74° N.) von Middendorff *(f 2)* found a nest with 4 eggs, catching the female at the same time. The eggs he speaks of as greenish brown, spotted; found in a depression in the moss of the marshy hollow, and scarcely 20 paces from a pool. The nest was bedded only with dry willow leaves, apparently wind-driven. Taczanowski *(13)* held these to belong to his *Tringa minuta orientalis*, a supposed subspecies, as to the validity of which we are in doubt.

Distribution. Bering Id. (Stejneger *k 1*); E. Siberia (Pallas *a 1*, Middendorf, etc. *13*); Sakhalien (Nikolski *13*); Kurile Is. (Snow *f 11*); Japan (Henderson, etc. *f 11*); Corea (Campbell *10*); China (David *3*, Styan *5*, etc.); Formosa (Swinhoe *d 8*); Hainan (Styan *12*); Philippines — Bohol (Everett *d 5*), Negros and Cebu (Bourns & Worcester *14*), Palawan (Platen *13*, Whitehead *6*, *8*); Borneo (Schwaner, Everett, etc. *7*); at sea near Cochin China (Swinhoe *j 1*); Malay Peninsula (Hume *d 6*); ?Andamans and Nicobars (Hume & Davison *f 6*); Java (S. Müller etc. *f 3*); Sumba (ten Kate *f 12*); Flores (Weber *f 13*); Timor (S. Müller *f 3*, Riedel); Saleyer (Everett *16*); Celebes — (Forsten *f 3*), Limbotto (Meyer *f 8*, Rosenberg *f 9*); Great Sangi (Meyer *d 10*); Moluccas — Halmahera, Weeda, Makian, Morty, Ternate (Salvadori *d 8*, *d 15*), Buru (Rosenberg *f 6bis*); Papuasia — Salawatti,

Kei, Aru, New Guinea, Duke of York Id., New Britain (Salvadori *d 8*); Islands of Torres Straits (McGill. *d 8*); Pole Id. (D'Albertis *d 8*); Australia and Tasmania (Ramsay *d 14*); Pelew Islands (Mus. Godef. *d 16*).

This form of the Little Stint has an extremely long, but, so far as is known, a somewhat restricted range in respect of longitudinal breadth. Its extreme northern limits are not known, for even in Bering Island Stejneger found it to be only a bird of passage, which arrived in May and passed on to some other place. It would appear from the remarks of Pallas and Middendorff that some probably remain to breed in the countries washed by the Sea of Ochotsk. It descends to Sakhalien, according to Nikolski's observation *(13)*, in enormous bands at the end of August. Middendorff remarks that the birds he found in the far North of Siberia, to which the afore-mentioned eggs belong, differed from those of the east, and Taczanowski *(13)* has separated them as *T. minuta orientalis*, a form wanting the ferruginous on the jugulum, sides of neck and cheeks. If a good species, and not the immature *T. ruficollis*, its range would appear to be somewhat more central than that of *T. ruficollis*. Southward the latter pursues its way in autumn through China (David *3*, De La Touche *11*) and Japan *(f 11)*, and onward through the East India Islands as far as Australia and Tasmania. A certain number no doubt winter in the Archipelago, but we suspect that Mr. Whitehead's remark touching Borneo is largely true for the other tropical islands — that, while it winters in small flocks, it is "like all the rest of the Sandpipers, only common, or apparently so, during the time it is actually moving south or north". From Limbotto Meyer records it in July. Swinhoe *(j 1)* got it on board ship near Cochin China on May 14th, 1872. From the Indian countries it has not yet been recorded, but Mr. Hume could point to no safe mark of distinction between this species and *T. minuta* (which occurs there) when they are both in winter plumage. Col. Legge affirms that *T. ruficollis* is a larger bird with a proportionally larger foot and tarsus, having a pure white chest and a greater extent of white on the forehead, as well as a greyer upper surface.

GENUS CALIDRIS Cuv.

Easily distinguishable from *Tringa* and other small Stints by its having no hallux. The bill, Snipe-like in character, though short, ensures its distinction from the small Plovers. Migratory; almost cosmopolitan.

334. ? CALIDRIS ARENARIA (L.).

Sanderling.

a. **Tringa arenaria** *(1)* Linn., S. N. 1766, I, 251 (from Willughby); *(2)* Schl., Mus. P.-B., Scolopaces, 1864, 55; *(3)* Rosenb., Zool. Garten 1881, 167; *(3bis)* W. Blas., J. f. O.

1883, 127; *(4)* Seebohm, Distr. Charadr. 1887, 432; *(5)* id., B. Japan 1890, 336; *(6)* Wiglesw., Aves Polyn. 1892, 64.

Calidris arenaria *(1)* Illig., Prodr. 1811, 249; *(II)* Naum., Vög. Deutschl. 1834, VII, 353, t. 182; *(III)* Newton, P. Z. S. 1871, 56, pl. IV, fig. 2 (egg); *(IIIbis)* Dresser, B. Eur. 1877, VIII, 101, pls. 559, 560; *(4)* David & Oust., Ois. Chine 1877, 467; *(5)* Legge, B. Ceylon 1880, 1220; *(6)* Oates, B. Brit. Burmah 1883, II, 398; *(7)* Baird, Brew. & Ridgw., Water B. N. Am. 1884, I, 249; *(8)* Everett, Ibis 1890, 465; *(9)* Wilson, B. Sandwich Is. pt. III, 1892; *(10)* De La Touche, Ibis 1892, 499; *(11)* Tacz., Faun. Orn. Sib. Orient. 1893, IV, 841; *(12)* Sharpe, Ibis 1894, 541; *(13)* Newton, Dict. B. pt. III, 1894, 803; *(14)* Sharpe, Cat. B. 1896, XXIV, 526, 766.

For synonymy and further references cf. most of the above-cited works.

Figures and descriptions. Naumann *II*, Dresser *IIIbis*, Seebohm *a 4* (woodcut); Legge *5*; Taczanowski *11*; Sharpe *14*; etc., etc.

Immature in autumn plumage. Above mealy white, slightly buffy on head and some parts of upper surface, with broad sagittate black centres on mantle, back and scapulars, the head above broadly streaked, the forehead, sides of head finely lined with black, hind neck greyer; middle of rump and upper tail-coverts greyish brown, buffy towards tip with a narrow terminal line of black; wing-coverts dark brown, the middle ones chiefly buffy white, the greater series broadly tipped with white forming a cross-band; remiges externally black, unexposed inner webs grey, shafts white, except at tip; tail-feathers greyish brown, edged and tipped with white, the lateral feathers paling almost into white; all the under-parts white, slightly tinged with buff on sides of breast; no hind toe; "iris brown; bill black; legs and feet black" (Legge *5*); wing 121 mm, tail 50, tarsus 25, middle toe with claw 20, exposed culmen 24.5 (♂, Dresden, 3. Nov. 1894: Schwarze — Nr. 14328)[1].

Winter plumage. In winter the adult differs from the young in having the upper-parts cinereous with dark streaks, the face and forehead white like the under-parts.

Summer plumage. In summer the adult differs from the young in winter in having the broad white borders of the feathers of the upper-parts replaced by rusty red (the centres being black) and the head, throat and breast are rusty red with streak-spots of black.

Eggs. 4; oblong pyriform; brownish olive, marked with faint spots and small blotches of bistre, a little more numerous about the larger end; size circa 34 × 24.5 mm (from Newton *III* and B., B. & R. *7* — from near the Anderson River, America, 68° N. — MacFarlane).

Nest. That in which the above eggs were found is said to have been of hay and decayed leaves *(III)*.

Distribution. Europe; Africa; Madagascar; Asia; America. — E. Siberia (Middend. etc. *11*); China (David *4*, Swinhoe, De La Touche *10*); Japan (Blakiston, etc. *a 4*); India (Hume, etc. *5*); Ceylon (Legge *5*); Burmah (Armstrong *6*); Cochin China (Tiraud *6*); N. Borneo (Everett *8*, *12*, *14*, Pretyman *14*); Java (Kuhl & v. Hasselt *a 2*); ?N. Celebes — Limbotto (v. Rosenberg *a 3*); Marshall Is. (Finsch *a 6*); Sandwich Is. (Wilson *9*).

In Rosenberg's list *(a 3)* of the birds collected by him at Lake Limbotto from August 11th to September 14th, 1863, and January 5th to February 3rd, 1864,

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[1] This specimen, which was shot by K. Schwarze of the Dresden Museum on the strand of the Elbe, affords the first record of the occurrence of the Sanderling in Saxony.

5 specimens of *Tringa arenaria* are put down. The record in itself is probable enough, and v. Rosenberg's list of birds from Limbotto seems to be fairly free from error, which is unfortunately more than can be said for that in his "Malayischen Archipel". Where these five specimens, if rightly determined, now are is unknown; the most accomplished travellers, without a museum and library to help them, sometimes err in their determinations, and some doubt must exist about the occurrence of the Sanderling in Celebes until further evidence is forthcoming. Mr. Büttikofer kindly informs us (in lit.) that there is no specimen of *C. arenaria* from Celebes in the Leyden Museum, which contains most of v. Rosenberg's results.

As a breeding species the Sanderling is an arctic bird, and its eggs rank among the greatest rarities, having been discovered as yet only in four spots — in British Arctic America as mentioned above, in Grinnell Land, Greenland, and Iceland. In autumn it migrates south and has been met with as far as Cape Colony in Africa and Patagonia in America. According to David it is abundant in China both as a bird of passage and as a winter visitor. Further south in this direction it seems to be of much more uncommon occurrence. In 1880 Legge *(5)* could only point to one specimen killed in Ceylon out of a flock, and Armstrong up to 1883 had alone obtained it in Pegu *(6)*. Three specimens are now known from North Borneo *(12)* and three from Java. None have as yet been recorded from the Philippines, nor from Sumatra, nor from the islands east and south-east of Java and Celebes.

The Sanderling may easily be distinguished from all other Stints by its having no hind toe. From the three-toed Plovers its more slender deeply grooved bill, in the basal fourth of which the nostril is situated, and for most cases its transversely scaled (not reticulated) tarsus are sufficient marks to distinguish it. Some embryos from eggs taken in Iceland, believed to be of the Sanderling, were found by Messrs H. H. Slater and T. Carter (Ibis 1886, 50) to possess a hind toe.

The Sanderling haunts the strand of the sea, of rivers and of lakes, feeding upon insects, their larvae and small worms.

GENUS PHALAROPUS Briss.

The Phalaropes are easily distinguished from the other *Limicolae* by having the soles of the toes broadened so as to form swimming lobes, much as is seen in the Coots and Grebes, and towards the base of the toes united to form a web. In other respects they are like the Stints. (Compare, also, fig. of sternum in Seebohm's "Charadriidae", pp. 343, 414). They differ from their allies by their aquatic habits. Three species are known; migratory; almost cosmopolitan.

335. PHALAROPUS HYPERBOREUS (L.).

Red-necked Phalarope.

a. **Tringa hyperborea** *(1)* Linn., S. N. 1766, I, 249.

b. **Tringa lobata** *(1)* Linn., S. N. 1766, I, 249 (? partim).

Phalaropus hyperboreus *(1)* Lath., Index Orn. Suppl. 1790, II, 775 (syn. excl.); *(2)* Schl., Mus. P.-B., Scolopaces, 1864, 58; *(III)* Dresser, B. Eur. 1874, VII, 597, pls. 537, 539, fig. on right; *(4)* Seeb., Brit. B. 1885, III, 89, pl. 27 (egg); *(5)* id., Distr. Charadr. 1887, 340; *(6)* id., B. Japan 1890, 318; *(7)* Newton, Dict. B. pt. III, 1894, 712; *(8)* Sharpe, Cat. B. 1896, XXIV, 698.

c. **Phalaropus angustirostris** *(I)* Naum., Vög. Deutschl. 1836, VIII, 240, t. 205.

d. **Phalaropus australis** [Temm. MS.]; *(1)* Bp., Compt. Rend. 1856, XLIII, 421, Nr. 159; *(2)* Schl., Mus. P.-B., Scolopaces, 1864, 59, Nr. 10.

e. **Lobipes hyperboreus** Cuv. *(1)* Wald., Tr. Z. S. 1872, VIII, 97; *(2)* Hume, Str. F. 1873, I, 246; *(3)* David & Oust., Ois. Chine 1877, 482; *(4)* Hume, Str. F. 1878, VII, 150; *(5)* Barnes, ib. 1880, IX, 459; *(6)* Salvad., Orn. Pap. 1882, III, 311; *(7)* id., ib. Agg. 1891, 201.

f. **Phalaropus lobatus** *(1)* Brügg., Abh. Ver. Bremen 1876, V, 96; *(2)* Stejn., Bull. U. S. Nat. Mus. Nr. 29, 1885, 139; *(3)* id., Pr. U. S. Nat. Mus. 1887, X, 394.

g. **Lobipes lobatus** *(1)* Baird, Brew. & Ridgw., Water B. N. Am. 1884, I, 330.

h. **Phalaropus cinereus** *(1)* Tacz., Faun. Orn. Sib. Orient. 1893, II, 848.

"Lorie tobo", Manado tua, Nat. Coll.

For further synonymy and references cf. Naumann *c I*; Dresser *III*; Salvadori *e 6*; Baird, Brewer & Ridgway *g 1*; Taczanowski *h 1*; Sharpe *8*.

Figures and descriptions. Naumann *c I*; Dresser *III*; Seebohm *4*, *5* (woodcut); Hume *e 2*; Salvad. *e 6*; Baird, Brewer & Ridgw. *g 1*; Taczanowski *h 1*; Sharpe *8*; etc.

Winter plumage. Head above (except forehead), hind neck and ear-coverts smoky blackish, feathers of crown fringed with buff; mantle, back, scapulars, innermost remiges and upper tail-coverts sooty black, with broad buff margins to the feathers; middle of rump greyer than the back; wing-coverts and quills browner, the greater coverts broadly tipped with white, some of the inner secondaries edged and tipped with the same; shafts of the remiges white; tail-feathers grey, edged with white; forehead, cheeks, sides of neck, and under-parts white, mottled with brownish grey on sides of breast and sides, metacarpal under surface brownish grey and white (Astrachan: Henke — Nr. 13561).

Changing plumage, winter—summer. Differs from the winter plumage in having a broken collar of ferruginous on neck and jugulum, a few marks of ferruginous on mantle and scapulars; the upper plumage is slaty grey with whitish edges to the feathers (not blackish, with buff edges; the change being possibly due to bleaching in the living bird). Manado tua Id., 11. April, 1893: Nat. Coll. — C 12108).

Breeding plumage. On sides of nape and neck, passing around the jugulum, a broad collar of ferruginous; chin, upper throat and below the ear-coverts white; rest of head and hind neck, cervical collar, and upper parts sooty black, passing on to the breast and sides; a stripe of ferruginous along each scapulary region, the greater wing-coverts broadly tipped with white, some of the middle ones slightly so; lower breast, abdomen and under tail-coverts white, shaded with brown about the flanks; "legs greyish lead-colour, the webs of the lobes lighter; iris dark brown": Dresser *III* (Europe — Nr. 11362).

Female. The female is larger than the male, very similarly, but much more brightly and richly coloured.

Measurements.	Wing	Tail	Exposed culmen	Tarsus	Mid. toe with claw
3 ♂ ad., Bering Id. (Stejneger *f 2*) .	101—104	47—52	19—21	20—21	20—21
4 ♀ ad., Bering Id. (Stejneger *f 2*) .	106—113	50—54	20—22	20—22	20—22
ad., Manado tua, 11. April, 1893 . .	107	52	21	19	18

Eggs. 4; pale buff and rich ochraceous buff to pale olive, thickly blotched, spotted and speckled with rich umber-brown, blackish brown and pale brown, and with a few greyish underlying markings; size 26.7—30.5 × 20.3—21.6 (from Seebohm *4*; see, also, Naumann *c I*, Dresser *III*, Taczanowski *h 1*, Baird, Brewer & Ridgw. *g 1*, etc.).

Nest. In the neighbourhood of water, on short grass or among low plants, where on a dry spot, usually a small hillock, the birds form a slight hollow among small grass-tufts, lining it in a careless manner with a few dry bents (from Naumann).

Distribution. Europe; N. W. Africa; Asia; N. America (Dresser *III*, Baird, Brew. & Ridgw. *g 1*). — India (Jerdon *e 6*, Hume *e 2*, *e 4*); East Siberia (Middend., etc. *h 1*); Bering Id. (Stejneger *f 2*); Sakhalien (Nikolski *h 1*); Kurile Is. (Snow *6*); Japan (Perry, etc. *6*); Loochoo Is. (Nishi *f 3*); China (Swinh. *e 6*, David *e 3*); Celebes — (Reinwardt *2*), Minahassa (Fischer *f 1*), Manado tua Id. (Nat. Coll.); Amboina, New Guinea, Aru, New Britain (Salvad. *e 6*).

The Red-necked Phalarope has rarely been met with on the coast of Celebes, and is probably a somewhat irregular winter visitor. In Borneo and the Philippines, where it must also occur, it has not yet been noticed. It was first obtained in Celebes by Reinwardt, subsequently in one example by Fischer, and in two (one now in the Dresden and the other in the Tring Museum) from the little island of Manado tua in April, 1893, by our native hunters; all four examples were in more or less complete winter dress. The bird breeds in rather high latitudes, for instance, some parts of the west coast and islands of Scotland, the Faroes, Iceland, Greenland, Finmark, Perm, the Taimyr River, E. Siberia, Bering Island, the northern coast of America, as shown in the works of Dresser, Taczanowski, and Baird, Brewer and Ridgway. In winter a southern migration takes place, but the majority of individuals do not, as a rule, appear to pass so far south as the East Indies, where it must be regarded as a rare species.

The food of the Red-necked Phalarope was found by Naumann to consist of very small worms, which infest floating sea-weeds, insects, larvae and such like. This food it seeks on the strand, especially in muddy spots, also wading after it, or taking it as it swims about. Prof. Newton remarks: "A more entrancing sight to the ornithologist can hardly be presented than by either of the two species (*P. hyperboreus* and *P. fulicarius*). Their graceful form, their lively coloration, and the confidence with which both are familiarly displayed in their breeding-quarters can hardly be exaggerated, and it is equally a delightful sight to watch these birds gathering their food in the high-running surf, or

when that is done peacefully floating outside the breakers" *(7)*. To the ornithologist, also, who has never watched them in life, the Phalaropes are interesting birds in virtue of the strongly pronounced seasonal change of plumage, of their Coot-like feet, and from the circumstance, which Naumann suspected in part and which Prof. Newton now states definitely, that the male undertakes the duty of incubation, when it sits so fast that it only leaves the nest to escape being trodden upon; moreover, it is the female which wears the brighter, handsomer plumage and is the larger bird. The same conditions are found in *Turnix* and *Centrococcyx*. These facts, of which there are very few examples in ornithology, prove that a higher development of plumage and ornament on the one hand and the so-called maternal instincts on the other are not exclusively connected with sex.

GENUS LIMICOLA K. L. Koch.

Plumage like that of a Snipe. Tarsus longer than middle toe and claw, shorter than the bill. The bill is very high at the base, flat in the middle, and decurved towards the tip. It differs from the Snipes by its short toes, and the eye not being set far back in the head; from the Stints by its plumage and bill. A single species ranging from the north of the Palaearctic Region to Celebes and the Moluccas in winter.

336. LIMICOLA PLATYRHYNCHA (Temm.).

Broad-billed Sandpiper.

a. **Tringa platyrincha** *(1)* Temm., Man. d'Orn. 1815, 398.

b. **Limicola pygmaea** (Bechst.); *(1)* Koch, Baier. Zool. 1816, 316; *(2)* Radde & Walter, Ornis 1889, 114, 232, 277.

c. **Tringa platyrhyncha** *(1)* Meyer & Wolf, Orn. Taschenb. 1822, III, 259; *(2)* Schl., Mus. P.-B., Scolopaces, 1864, 49; *(3)* Hume, Str. F. 1873, I, 244; *(4)* id., ib. 1874, II, 298; *(5)* David & Oust., Ois. Chine 1877, 470; *(6)* Seeb., Ibis 1884, 33; *(7)* id., Distr. Charadr. 1877, 433; *(8)* id., B. Japan 1890, 337; *(9)* Styan, Ibis 1891, 330, 506; *(10)* Gätke, Vogelwarte Helgol. 1891, 525; *(11)* Styan, Ibis 1893, 437; *(12)* Büttik., Zool. Erg. Weber's Reise 1893, III, 283; *(13)* Newton, Dict. B. pt. III, 1894, 813.

d. **Limicola hartlaubi** *(1)* Verr. in Vinson's Voy. Madag. Annexe B. 1865, 5; *(2)* Hartl., Vög. Madag. 1877, 322.

Limicola platyrhyncha *(1)* Salvad., Cat. Ucc. Borneo 1874, 322; *(II)* Dresser, B. Europe VIII, 3, pl. 545 (1876); *(3)* Hume & Davis., Str. F. 1878, VI, 461; *(4)* Wald., P. Z. S. 1878, 712; *(4bis)* Hume, Str. F. 1879, VIII, 158; *(5)* Legge, B. Ceylon 1880, 896; *(6)* Wardl. Rams., Tweedd. Orn. Works 1881, 660; *(7)* Oates, B. Brit. Burmah 1883, II, 387; *(8)* Gigl. & Salvad., P. Z. S. 1887, 586; *(9)* W. Blas., Ornis 1888, 319; *(10)* id., Ibis 1888, 374; *(11)* Everett, J. Str. Br. R. A. S. 1889, 207; *(12)* Whitehd., Ibis 1890, 59; *(13)* Steere, List Coll. B. & M. Philipp. 1890, 26; *(14)* Sharpe, Cat. B. 1896, XXIV, 612, 769.

For further synonymy cf. Dresser *II*; Sharpe *14*.

Figure and descriptions. Dresser *II*; Legge *5*; Oates *7*; Sharpe *14*; etc., etc.

Summer plumage. Snipe-like: crown and occiput black, running down narrowly to the culmen, the feathers slightly margined with yellowish brown; sides of forehead pale brown, passing as a streak on to sides of occiput, a second streak above the ear-coverts; lores and ear-coverts dark brown; neck and breast whity-brown, whiter on cheeks and throat, everywhere streaked or spotted with dark brown; upper-parts black, with borders of tawny olive and whity-brown to the feathers, upper tail-coverts nearly black, mixed at the sides with white; wing-coverts and remiges dusky, the greater coverts tipped with white, shafts of remiges white; under-parts white, streaked and spotted with brown on sides, under tail-coverts at sides, and against the metacarpal edge; "iris brown; bill black, slightly pale at the base beneath; legs brown" (Legge *5*); wing 107 mm; tail 38; tarsus 22.5; middle toe 21; exposed culmen 31 (N. Europe — Nr. 11375).

Adult in winter. "Upper parts generally ashy grey with a dusty brownish tinge, the centres of the feathers darker; rump black, most of the feathers with light margins; wing and tail as in the summer dress, but rather lighter; under-parts white, the throat slightly marked with small, short, blackish grey striations" (Dresser *II*).

Young in first autumn. According to Dresser, differs but little from the adult in summer.

Eggs. Stone-buff, darker or lighter, marked with a few faint purplish grey underlying shell-spots, and with a great or smaller amount of rich dark umber-brown or reddish umber surface-spots and blotches; size 31—31.7 × 21.6—23.5 mm (from Dresser *II*).

Nest. "The broad-billed Sandpiper differs from other wading birds in the situation of its nest, choosing open soft spots in the marsh where there is little else than bog-moss with a light growth of a kind of sedge; and on a low tuft just rising above the water its nest may be found, often without much difficulty . . . its eggs . . . about the third week of June. Many empty nests are found for one that is occupied . . . They are neatly rounded hollows, and have a few bits of dry grass at the bottom" (Wolley *II* — Lapland).

Distribution. Europe; Egypt; Madagascar; S. W. Asia; Indian countries; Japan to Celebes. — India (Jerdon, etc. *5*); Ceylon (Legge *5*); Andamans (Davison *c 4*); Burmah (Oates, etc. *7*); Tenasserim (Armstrong *3*); Malay Peninsula (*4bis*, *7*); China (David *c 5*, *c 9*); Corea (*8*); Japan (Blakiston *c 8*); Formosa (Swinhoe *c 5*); Hainan (Styan *c 11*); Philippines — Bohol (Everett *4*), Negros (Steere *13*), Palawan (Platen *9*, *12*); Java (Reinwardt *c 2*); Celebes — Luwu on the Gulf of Boni (Weber *c 12*); Amboina (Wallace *14*).

A single specimen of the Broad-billed Sandpiper from Celebes in Prof. Weber's collection has recently been recorded by Mr. Büttikofer. It is new to the avifauna.

The genus *Limicola* may be distinguished from *Tringa* by its bill — very high at the base, flat and broad in the middle, decurved at the tip — and by its Snipe-like plumage. Its affinities seem to lie between the Sandpipers and the Snipes. The present species, with a supposed eastern race *L. sibirica* Dress., is the only representative of the genus. According to Mr. Dresser the East Siberian bird in breeding plumage has the upper parts rufous, herein agreeing with the eastern race of the Little Stint; this form is found in China in winter. Its validity is admitted in Taczanowski's work (Faun. Orn. Sib. Orient. 1893, II, 924), but a fresh comparison does not seem to have been made. Other authors,

among them Sharpe *(14)*, do not admit it as a good species. In the usual order of things it should be this supposed eastern form which descends to Japan, China, Formosa, Hainan, the Philippines, but Java and South-central Celebes are equally likely to be reached by specimens descending the Malay Peninsula from the north-west, as seems to be the case with *Lanius tigrinus* and perhaps *Butastur liventer*. Mr. Dresser himself, however, believed Everett's specimen from Bohol, Philippines *(4)*, to be *L. platyrhyncha*.

The Broad-billed Sandpiper was found breeding in Lapland by Wolley and on the Dovrefjeld in Norway by Mitchell and others; the eggs are not yet known from Eastern Asia. In autumn it migrates south, but in the East the greater number seem to stop before reaching the Archipelago, and the specimens which have been obtained there are so few in number that they almost seem to come under the head of stragglers.

GENUS GALLINAGO Leach.

In the Snipes the eye is situated far back, almost as it were in the side of the occiput; the bill is straight, about twice the length of the head, terminally soft and nervous, the upper mandible overlapping the lower and notched behind the tip to allow for the latter fitting to it, the nasal groove reaching well into the terminal third. Middle toe and claw longer than the tarsus, which is transversely scutellated. Rectrices 12 to 26 in number, the lateral ones greatly attenuated when the number is large. Wing moderate, the inner secondaries nearly as long as the primaries, the middle ones about half their length. The Snipes are migratory, and almost cosmopolitan in their distribution.

337. GALLINAGO MEGALA Swinh.

East Siberian Snipe.

Gallinago megala *(1)* Swinh., Ibis 1861, 343; *(2)* id., Ibis 1863, 415; *(3)* Schl., Mus. P.-B., Scolopaces, 1864, 12; *(4)* Wald., Tr. Z. S. 1872, VIII, 98; *(5)* Salvad., Cat. Ucc. Borneo 1874, 334; *(6)* Wald., Tr. Z. S. 1875, IX, 235; *(7)* Tweedd., P. Z. S. 1877, 768; *(8)* David & Oust., Ois. Chine 1877, 477; *(9)* Tweedd., P. Z. S. 1878, 345, 953; *(9bis)* Prjev., Rowl. Orn. Misc. 1878, III, 92; *(10)* Meyer, Ibis 1879, 143; *(11)* Legge, B. Ceylon 1880, 817; *(12)* Salvad., Orn. Pap. 1882, III, 337; *(13)* Everett, J. Str. Br. R. A. S. 1889, 206; *(14)* Whitehd., Ibis 1890, 60; *(15)* Sharpe, t. c. 145; *(16)* Steere, List Coll. B. & M. Philippines 1890, 26; *(17)* Styan, Ibis 1891, 330, 505; *(18)* Wiglesworth, Av. Polyn. 1892, 67; *(19)* De La Touche, Ibis 1892, 492; *(20)* Bütt., Zool. Erg. Weber's Reise 1893, III, 283; *(21)* Tacz., Faun. Orn. Sib. Orient. 1893, II, 956; *(22)* Bns. & Worces., B. Menage Exped. 1894, 31; *(23)* Grant, Ibis 1894, 522; *(24)* Hart., Nov. Zool. 1896, 180; *(25)* Sharpe, Cat. B. 1896, XXIV, 624, 769.

a. **Scolopax (Spilura) stenura** *(1)* Radde (nec Kuhl), Reis. S. O. Sibir. 1863, 334, pl. XIII.

b. **Gallinago heterocerca** *(1)* Cab., J. f. O. 1870, 235; *(2)* Tacz., ib. 1873, 104, t. II, f. 31 (egg).

c. **Scolopax megala** *(1)* Rosenb., Malay. Archip. 1878, 278; *(2)* id., Zool. Garten 1881, 167; *(3)* Seeb., Distr. Charadr. 1887, 479; *(4)* id., B. Japan 1890, 343.

d. **? Scolopax australis** *(1)* Sharpe, Ibis 1888, 203.

e. **Scolopax stenura** Kuhl (**Gallinago stenura** *auctorum*).

For further synonymy and references cf. Salvadori *12*; Taczanowski *21*; Sharpe *25*.

Figure and descriptions. Radde *a I*; Swinhoe *1*; David & Oust. *8*; Salvadori *12*; Seebohm *c 3* (woodcut of tail); Taczanowski *21*; Sharpe *25*.

Autumn. Head above black, with a mesial stripe of buff-brown; back and scapulars black, with a long buff-brown interscapulary stripe on each side and the scapulars broadly edged with buff-brown; lower back blackish brown, with whitish tips, rump with buff-brown tips; upper tail-coverts more russet brown, with indistinct bars; tail-feathers, 20 in number, black, with a broad (ca. 1 cm) subterminal space of dark ferruginous on the six middle feathers, bounded distally with an irregular black line, the tip whitish; the lateral rectrices much attenuated (the outermost ca. 2.5 mm broad at 10 mm from tip, the sixth ca. 6 mm broad), tipped with white, basally blackish, the outermost two or three mottled basally with blackish and white; lesser and outer greater wing-coverts, primary coverts and remiges dark hair-brown, most of the coverts tipped with white; middle and inner greater wing-coverts and tertiaries pale brown varied with blackish bars; sides of forehead and superciliary stripe, cheeks and upper throat buff-brown; loral stripe blackish; neck all round, ear-coverts, jugulum, upper breast, sides and under tail-coverts duller buff-brown, streaked with blackish, tending to form bars on sides and tail-coverts; abdomen white; under wing-coverts barred with blackish and white, the dark bars rather the broader; "bill blackish brown; feet grey; iris nearly black" (Taczan. *21*); wing 140 mm; tail 55; tarsus 33; mid. toe with claw 38; exp. culmen 60 (♂, N. Bohol, Nov. 1877: Everett — C 5426).

Sex. The sexes are similar in coloration.

Young. The young in down are described by Taczanowski as having a colour quite different from that of the young of *G. scolopacina*, being altogether paler (described: *b 2*, *21*).

Eggs. Ground-colour cream-white or a little more yellowish, or pale and dirty ochre; underlying spots reddish ashy, superficial ones reddish brown or brown, the large ones obliquely grouped as dashes at the large end, where there are also some streaks, some zigzags or black spots, on the rest of the surface only points and little streaks intermingled with a small number of dashes of moderate size; measurements 40—43 × 30—32 mm (from Taczanowski *21*).

Nest. Situated in a dry place covered with plant-growth, always in the open, even in bush-grown spots; the nest a little cavity lined with dry plants (Baikal country — Taczanowski *21*).

Distribution. East Siberia (Radde, etc. *21*); Sakhalien (Nikolski *21*); Japan (Pryer *c 4*); China (Swinhoe *1*, David *8*, etc.); Formosa (Swinhoe *2*); Philippines — Luzon (Jagor *6*, Whitehead *23*), Cebu and Leyte (Everett *7*, *9*), Siquijor, Negros, Masbate, Panay, Sibuyan, Calamianes, Tawi-Tawi (Bourns & Worcester *22*), Basilan (Steere *16*), Mindanao (Everett *9*, Steere *16*), Palawan (Whitehd. *13*, *14*); N. Borneo (Whitehead *15*); Celebes — Manado (Meyer *10*), Gorontalo Distr. (Forsten *3*, v. Rosenb. *c 2*), Macassar (Weber *20*); Saleyer (Everett *24*); Moluccas — Halmahera, Ternate, Batchian, Amboina (Salvadori *12*); Pelew Is. (Kubary *18*).

Swinhoe separated this Snipe from *G. stenura* (Kuhl) on the ground that it was larger and had fewer and broader attenuated lateral rectrices. The eggs

of *G. stenura* are not yet on record; Seebohm met with it on the Yenesei, and Taczanowski remarks that it takes its way to East Siberia for its nidification; it is in E. Siberia that *G. megala* breeds. *G. stenura* is, however, said to wander in winter through China, to India, Ceylon, Burmah, Tenasserim down the Malay Archipelago to Sumatra, Borneo, Java, Timor. *G. megala*, on the other hand, is supposed to have a West Pacific migration, passing through China to the Philippines, N. Borneo, Celebes and the Moluccas. As to size, we can see no difference between the two birds; this also was the experience of Legge *(11)*. The only reliable mark of distinction is supposed to be found in the rectrices, of which *stenura* has 26, the outermost 8 on each side much attenuated (2 to 4 mm, according to Seebohm), while *megala* should have 20, the outermost 6 attenuated (4 to 8 mm, Seebohm *c 3*). We suspect that the two forms are not distinct, but that *stenura* is simply represented by older individuals, *megala* by younger ones, or vice-versa. Legge finds the normal number of "pin" tail-feathers in *stenura* to be six, but "seven and even nine have been detected on careful examination, and Swinhoe speaks of a specimen with only four". As to the total number of rectrices, we have a specimen apparently of *G. megala* labelled Celebes, with 22 feathers; Schlegel says *megala* has 18 or 20, and Taczanowski gives 24 to 26 as the number in *stenura*. The sequence is, therefore, complete; and we believe that these figures are not easily to be explained on the ground of moulting or shooting away, but that the tail varies with age or individually.

Another Snipe, which is almost sure to be found in Celebes sooner or later, is *G. australis* Lath., which Seebohm diagnoses by its having 18 tail-feathers, of which only two on each side are less than 7.6 mm in width; it is also larger than *G. megala*, viz. wing 152—165 mm. It is known from Japan, where it breeds, and from Australia and Tasmania, where it winters.

GENUS LIMOSA Briss.

The bill of *Limosa* has much in common with that of *Gallinago*, being very long, with the nasal groove continued almost to the tip, but it is upcurved and not pitted at the tip. The tarsus is also longer than the middle toe, and there are 12 rectrices. The size is much larger.

The bill, with its continuous groove and the gape not overreached by the loral and malar feathers sufficiently distinguishes *Limosa* from the Totanine forms, and shows its affinities to be more with the Snipes. Dr. Sharpe recognises 4 species, breeding in the North and wintering in more southern latitudes of the World.

338. LIMOSA NOVAEZEALANDIAE (G. R. Gray).

Pacific Bar-tailed Godwit.

a. **Limosa baueri** *(1)* Naumann, Vög. Deutschl. 1836, VIII, 429 (descr. null.[1])); *(2)* Pelz., Sitzb. Ak. Wien 1860, XLI, 327; *(3)* Salvad., Cat. Ucc. Borneo 1874, 331; *(4)* David & Oust., Ois. Chine 1877, 459; *(5)* Sharpe, Ibis 1878, 419; *(6)* Salvad., Orn. Pap. 1882, III, 329; *(7)* Oates, B. Brit. Burmah 1883, II, 410; *(8)* W. Blas., Ztschr. ges. Orn. 1886, 165; *(9)* Gigl. & Salvad., P. Z. S. 1887, 588; *(10)* Sclat., Ibis 1889, 249; *(11)* Salvad., Orn. Pap. Agg. 1891, 203.

b. **Limosa brevipes** *(1)* Gray, List B. Brit. Mus., Grallae, 1844, 95 (descr. null. — fide Seebohm *j 2*).[2])

c. **Limosa lapponica var. Novae Zealandiae** *(1)* Gray, Voy. Ereb. & Terror, B. 1844, 133. **Limosa novae-zealandiae** *(1)* Gray, Gen. B. III, 570 (1847); *(2)* Dresser, B. Europe VIII, 206 (1872); *(3)* Finsch, J. f. O. 1874, 196; *(4)* Legge, B. Ceylon 1880, 833; *(V)* Buller, B. New Zeal. 2nd ed. 1888, II, 40, pl. XXVIII; *(6)* Wiglesw., Av. Polyn. 1892, 66; *(7)* H. O. Forbes, Ibis 1893, 529; *(8)* Sharpe, Cat. B. 1896, XXIV, 377, 755.

d. **Limosa uropygialis** *(1)* Gould, P. Z. S. 1848, 38; *(II)* id., B. Austr. 1848, VI, pl. 29; *(3)* Swinh., Ibis 1863, 409; *(4)* Schl., Mus. P.-B., Scolopaces, 1864, 25; *(5)* Gld., Hb. B. Austr. 1865, II, 252; *(VI)* Finsch & Hartl., Orn. Centralpol. 1867, 177, t. XIII, figs. 1, 2; *(7)* Finsch, J. f. O. 1870, 348; *(8)* Homeyer, t. c. 423; *(9)* Wald., Tr. Z. S. 1872, VIII, 97; *(10)* Rosenb., Malay. Archip. 1878, 278; *(11)* id., Zool. Garten 1881, 167; *(12)* Hartl., J. f. O. 1883, 279; *(13)* Rams., Tab. List 1888, 20; *(14)* Everett, J. Str. Br. R. A. S. 1889, 209; *(15)* Gigl., Ibis 1891, 296; *(16)* Styan, t. c. 331, 507; *(17)* De La Touche, Ibis 1892, 500; *(18)* Newton, Dict. B. 1893, 367; *(19)* Rickett, Ibis 1894, 225; *(20)* M. & Wg., J. f. O. 1894, 252; *(21)* iid., Abh. Mus. Dresd. 1895, Nr. 8, p. 18.

e. **Limosa rufa** (nec Briss.); *(1)* Temm. & Schl., Faun. Jap., Aves 1850, 114; *(2)* Middend., Sibir. Reise 1851, II, pt. 2, p. 217, t. XIX, f. 5 (egg); *(3)* Seeb., B. Japan 1890, 328.

f. **? Limosa lapponica** *(1)* Steere, List Coll. B. & M. Philipp. 1890, 26.

g. **Limosa lapponica uropygialis** *(1)* Dyb. & Tacz., Bull. Soc. Zool. Fr. 1884, 146; *(2)* Seeb., Brit. B. 1885, III, 157.

h. **Limosa lapponica novae-zealandiae** *(1)* Baird, Brew. & Ridgw., Water B. N. Am. 1884, I, 258; *(2)* Mats. & Ziem., J. f. O. 1885, 189.

i. **Limosa lapponica baueri** *(1)* Stejn., Bull. U. S. Nat. Mus. 1885, Nr. 29, p. 122; *(2)* Tacz., Faun. Orn. Sib. Orient. 1893, II, 933.

j. **Limosa rufa uropygialis** *(1)* Tacz., Bull. Soc. Zool. Fr. 1885, 475; *(2)* Seeb., Distr. Charadr. 1887, 387.

"Bararanga", Kabruang, Talaut, Nat. Coll.

For further synonymy and references cf. Finsch & Hartl. *d VI*; Salvadori *a 6*; Stejneger *i 1*; Taczanowski *i 2*; Sharpe *8*.

Figures and descriptions. Gould *d II, d 5*; Buller *V*, Finsch & Hartl. *d VI*; Middend. *e 2* (fig. of egg); David & Oust. *a 4*; Salvad. *a 6*; Taczanowski *i 2*; Sharpe *8*; etc.

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[1]) With all deference to the opinion of Dr. Stejneger we cannot admit that Naumann ever described this bird. He does not pretend to discriminate it loc. cit. from *L. adspersa (= fedoa)*, and his only distinguishing remark that both are much bigger or longer-legged than *L. meyeri (= lapponica)* is wrong if applied to *L. novaezealandiae*. It is true only of *L. fedoa*.

[2]) Swinhoe, Schlegel, and Salvadori apply this name to the eastern form of the Black-tailed Godwit, *L. melanuroides* Gould.

Adult male in winter plumage. Head above, mantle, scapulars, tertiaries and wing-coverts dark brown (hair-brown), with borders to the feathers of fulvous white or white, very broad on the wing-coverts, forming deep notches on the tertiaries and scapulars; hind-neck grey, with obscure dark centres; lower back brown with fulvous tips; rump, upper tail-coverts and tail barred with dark brown and white; metacarpal and primary coverts and remiges blackish brown, the inner primaries and secondaries paler and bordered with white; shafts of remiges white, the exposed tips thereof blackish; supraloral stripe to above the ear-coverts whitish; face whitish, striolated with brown; fore-neck and breast pale buff-brown, with dark shaft-streaks chiefly at the sides; remaining under-parts buff-white, a few brown spots and shaft-streaks on the under tail-coverts; under wing-coverts and axillaries, the former with horse-shoe bars, the latter with irregular bars of grey-brown; primaries below grey mottled on basal half of inner web with whitish; "bill reddish white, tip black; feet slate-blue" (P. & F. Sarasin); iris "dark brown": Stejneger (♂, Kema, 23. Oct. 1893: P. & F. Sarasin).

This specimen has some of the cinnamon-tinted feathers of breeding plumage still left on forehead, lores and cheeks and upper throat.

Female in winter. Larger than the male. The tail is grey-brown in this example, mottled with white towards its base (♀, S. Island, New Zealand, Oct. 1872 — C 4715).

According to Seebohm *(g 2)* in the western form of this Godwit, *L. lapponica* (L.), "the tail of the young in first plumage, and of the adult in summer plumage, is always barred. Adults in winter plumage have plain tails, but those of birds of the year occasionally show traces of bars". The male described, like a second before us (Bohol, Nov. 1877) seems to be still wearing its summer tail.

Breeding plumage. In breeding plumage the bird has the face and under-parts rufous, the fore-neck, under tail-coverts, etc. more or less marked with brown; the upper-parts varied with rufous instead of white.

Sex. Sexual differences in this form have not received much attention since Middendorff pointed out *(e 2)* that the female, besides being much larger than the male, has a longer and flatter forehead (this we should think depends upon the size of the bill), a straighter bill, the upper tail-coverts with the white bars never washed with rusty; the belly variable — greyish white, or with black sagittate spots, or with rusty streaks, or unspotted.

Young. Much like the adult in winter (cf. Buller *V*, Taczanowski *i 2*).

Measurements.	Wing	Tail	Tarsus	Mid. toe with claw	Exposed Culmen
8 Males	199–223	68—81	50—61	33—41	78—110
3 Females	225—243	75—80	55—64	34—41	98—111

(from measurements given by Stejneger *i 1*, Taczanowski *i 2*, and ♂ North Celebes, and ♀ New Zealand).

Eggs. According to v. Middendorff 2 or 3 to a sitting; one figured is ovate, dusky olive with irregular black spots; size 56 × 38 mm *(e 2)*. Messrs Baird, Brewer and Ridgway *(h 1)* describe two eggs as deep greenish drab and pale drab respectively in ground-colour, the blotches on the former being of a dilute umber, much more pronounced in the second specimen; size 57 × 36 — 37 mm.

Nest. A rounded depression in a sedge tussock, with a lining of dry grasses (Dall *h 1* — Alaska).

Distribution. Alaska (Dall *h 1*, Nelson *a 10*); Bering Id. (Stejneger *i 1*); Prijbilof Is. (Elliot *h 1*); Aleutian Is. (Nelson *h 2*); East Siberia to the Taimyr River (Midd.,

etc. *i 2*); Corea (Kalinowski *i 2*); Kurile Is. (Pallas, Snow *e 3*); Japan (Siebold, etc. *e 3, e 1*); China (David, etc. *a 4*); Formosa seen only, and Hainan (Swinhoe *d 3, a 6*); Philippines — Bohol (Everett *8*), ?Negros (Steere *f 3*); Borneo (Ever. *d 14*); Singapore (Davison *8*); Java (v. Hasselt *d 4*); Timor (Sal. Müller *d 4*); Talaut — Kabruang (Nat. Coll. *d 20*); Celebes — (Forsten *d 4*), Minahassa (P.&F.S.), Gorontalo Distr. (Rosenb. *d 11*, Riedel *a 8*); Moluccas — Halmahera (Bernst. *d 4*, Wallace *8*); Papuasia — Aru, New Guinea, New Britain, Solomon Is. (f. Salvad. *a 6*); Is. Torres Str. (Salvad. *a 6*); Australia and Tasmania (Gould *d II*, Ramsay *d 13*); Polynesia — New Caledonia, Loyalty Is., New Hebrides, Caroline Is., Gilbert Is., Fiji, Samoa, and Tonga Is. (fide Wiglesw. *6*); New Zealand (Buller, etc. *V*); Chatham Is. (H. O. Forbes *7*).

The Pacific form of the Bar-tailed Godwit is very closely related to the *Limosa lapponica* of Europe and Asia (except the East), but may be recognised by its brown lower back with fulvous or whitish terminal edgings, as against the white with a few brown heart-shaped or arrow-head spots in *L. lapponica*; also the rump and upper tail-coverts of *L. novaezealandiae* are white barred with brown, as against white with a few brown spots (bars on the longer tail-coverts) in the western form, and a corresponding difference is seen on the under wing-coverts. *L. novaezealandiae* holds itself to the countries and islands washed by the Western and Northern Pacific; *L. lapponica* has been recorded as far east as the Yenesei (Seebohm) and by Lord Tweeddale (P. Z. S. 1878, 711) from Bohol in the Philippines. One of these specimens from Bohol is now before us; it cannot be separated from *L. lapponica*.

The Pacific Godwit breeds in the highest northern latitudes, and as yet its eggs seem to have been recorded from only two spots — from the Taimyr Peninsula of Siberia, 75° N., by von Middendorff, and from the mouth of the Yukon by Dall *(h 1)*. In winter the main body of individuals migrate across the Pacific, or over China, to Australia and New Zealand, in which latter country some remain all the year, and Sir Walter Buller *(V)* mentions an egg from there, which he can refer to no other species. The number of individuals which visit New Zealand seems to be enormous; Buller speaks of tens of thousands of birds having been seen setting off from the north of North Island on their northward journey, and mentions a case reported to him of ninety-seven being killed out of a pack at a single shot with an ordinary gun! In the East India Islands, on the other hand, this Godwit is evidently a rare bird. From Celebes we know of only three recorded specimens in Museums, but Rosenberg puts down 5 in his list of birds of Limbotto *(d 11)*, Schlegel records 2 specimens from Halmahera, 1 from Java, 2 from Timor; more recently it has been recorded by Dr. Sharpe and Mr. Everett from Sarawak and Labuan, also from the Philippines; David *(a 4)* and Styan *(d 16)* mention it as a bird of passage in China, but the former author adds that it even winters there also.

The bill of this bird, perhaps the most highly specialized organ of it, is very variable in length. From *Totanus* the genus *Limosa* may best be distin-

guished by its bill which is $1^1/_2$ to 2 times the length of the tarsus and has the nasal groove running down it almost to the extreme tip; from *Scolopax* the upcurved character of the bill, the middle toe shorter than the tarsus, the small web between the basal phalanges of the outer and middle toes, as well as the different type of plumage serve to separate it. In its changes of plumage from the greys and browns of winter to the fine brick red and brown of the breeding season it resembles *Phalaropus fulicarius* and certain *Tringae*, especially *Tringa subarquata*. As in *Phalaropus*, the female *Limosa* is a finer bird (at least in point of size) than the male. Moreover, as Prof. Newton (D. B. 366) points out, the male is believed to take the chief duty of incubation on himself[1]).

Limosa melanuroides Gld. which ranges from East Siberia south in winter to Australia, and which must sometimes set foot on Celebes, may be distinguished from the present bird by its black tail (except at base) and white upper tail-coverts.

GENUS NUMENIUS Briss.

The Curlews are best characterized by their long decurved bills, with the nasal groove discernible down to the terminal fourth; the toes webbed at the base and shorter than the tarsus; the tarsus for the most part transversely scutellated in front (in *N. minutus* behind also). Most of the species are of large size, and wear a general plumage of brown, varied with pale brown and white, below chiefly whitish, streaked or barred with brown.

Several forms occur, probably as winter visitors only, in Celebes. The genus is almost cosmopolitan.

339. NUMENIUS MINUTUS J. Gd.

Little Whimbrel.

Numenius minutus *(1)* Gld., P. Z. S. 1840, 176; *(II)* id., B. Austr. 1848, VI, pl. 44; *(3)* Schl,, Mus. P.-B., Scolopaces, 1864, 101; *(4)* id., Ned. Tdschr. Dierk. 1866, III, 348; *(5)* Wald., Tr. Z. S. 1872, VIII, 96; *(6)* Salvad., Cat. Ucc. Borneo 1874, 334; *(6bis)* Brügg., Abh. Ver. Bremen 1876, V, 464; *(7)* David & Oust., Ois. Chine 1877, 458; *(8)* Salvad., Orn. Pap. 1882, III, 334; *(9)* Meyer, Z. ges. Orn. 1884, 295; *(10)* Seeb., Ibis 1884, 34, 268; *(11)* id., Distr. Charadr. 1887, 335; *(12)* Dörries, J. f. O. 1888, 90; *(13)* Seeb., B. Japan 1890, 317; *(14)* Styan, Ibis 1891, 331, 508; *(15)* Salvad., Orn. Pap. Agg. 1891, 205; *(16)* De La Touche, Ibis 1892, 501; *(17)* Tacz., Faune Orn. Sib. Orient. 1893, II, 947.

a. **Numenius minor** (nec Briss., Leach); *(1)* S. Müll., Verh. Natuurk. Comm. 1839—44, 110; *(II)* Temm. & Schl., Faun. Jap., Aves 1850, 111, pl. 67; *(3)* Swinh., Ibis 1863, 409; *(4)* Gld., Hb. B. Austr. 1865, II, 280; *(5)* Dresser, B. Europe VIII, 245 (1873); *(6)* Seeb., Ibis 1885, 363; *(7)* Rams., Tab. List 1888, 20.

[1]) This point has received confirmation from Prof. Newton himself, who informs us *(in lit.)* that he has had the male bird shot from the nest.

b. **Mesoscolopax minutus** *(1)* Sharpe, Cat. B. 1896, XXIV, 371, 755.

For further references cf. Salvadori *8*; Sharpe *b 1.*

Figures and descriptions. Gould *II, a 4*; Temm. & Schl. *a II*; Salvad. *8*; Dresser *a 5* (diagn.); Seebohm *11* (diagn.); Sharpe *b 1.*

Description. Head above dark brown, varied with buff-brown edgings; mantle, scapulars and tertiaries dark brown, with buff-brown side-notches and tips; middle and greater wing-coverts much the same, but with more whitish mottlings; lower back and rump dark brown with whitish tips, the upper tail-coverts with whitish tips and notches; tail pale brown, with about 8 dark bars; lesser wing-coverts, alula, primary-coverts and remiges dark brown; lores and superciliary stripe buff, ear-coverts browner; under surface buffy, with streaks of brown on the neck all round, taking the form of narrow sagittate and brace-shaped bars on breast and sides; the under wing-coverts and axillaries buff with narrow bars; "iris black; bill fleshy (coloured) at the base, olive-brown at the tip; feet bluish lead-colour" (Gould *a 4*); wing 180 mm; tail 75; tarsus 50; mid. toe with claw 32; exposed culmen 45 ("♀", Java: v. Schierbrand — C 12375).

Female. The female is described by Taczanowski *(17)* as having the top of the head more strongly varied with fulvous than the male, the streaks on the sides of the head finer and less numerous, the outer web of the lateral rectrix yellow in the clear spaces.

Young. The young has not yet been described; probably it is much like the adults, but has the tertiaries, scapulars, etc. spotted, rather than notched, with buff-brown.

Eggs. Unknown.

Distribution. East Siberia from Dauria to Lake Baikal (Dybowski & Godlewski *17*); Mongolia (David *7*); Japan (Siebold *a II*, Pryer *a 6, 13*); Formosa (Swinhoe *a 3*); China (Swinhoe, David, etc. *7, 8, 14, 16*); Java (v. Schierbrand); North Celebes (fide Schlegel *4*, Riedel *6bis*); Batchian (Wallace *8*); Amboina (S. Müller *3, 8*); ? Mysol (v. Rosenberg *8*); Aru (fide Schl., *4, 8*, Ribbe *9*); Australia (Gould *II, a 4*, Ramsay *a 7*).

The Little Whimbrel has been recorded only twice from Celebes, viz. by Schlegel, who received an example, or examples, from the North of the island subsequently to publishing his catalogue of the Scolopaces in 1864, and by Brüggemann from Gorontalo, where it was obtained by Riedel. It seems to be altogether a somewhat rare species. Gould only once encountered a flock in Australia, but Dr. E. P. Ramsay is able to note its occurrence at a number of different points in the country. In the breeding season, Godlewski *(17)* observed it in Dauria, but did not find it breeding, as the traveller did not at this time visit the vast steppes covered with a feeble vegetation where the bird then takes up its quarters. Seebohm in 1890 could record only two examples from Japan. It has been more abundantly observed in China as a spring and autumn migrant; Mr. De La Touche remarks that, according to the native wild-fowlers, it is common during the spring passage near Foochow. In the East India Archipelago the records of its occurrence are of an isolated character.

Numenius minutus is at once distinguishable from the other Curlews found in Celebes by its small size and small slender bill; its lower back and rump

are concolorous with the other upper-parts, and its primaries are not varied with pale notches on the inner webs. Its nearest affinities are with *N. borealis* of America which differs by its somewhat larger size and shorter tarsus (the wing being about $4^1/_2$ times the length of it as against about $3^1/_2$ times in *minutus*). The hinder side of the tarsus of *N. borealis* is covered with small reticulate scales, that of *minutus* is described by H. Seebohm as being transversely scutellated behind as in front, but we find this character to be variable. Dr. R. B. Sharpe separates *N. minutus* generically on account of the scaling of the tarsus.

340. NUMENIUS VARIEGATUS (Scop.).

Oriental Whimbrel.

a. **Le Courlis tacheté de l'Isle de Luçon** *(1)* Sonn., Voy. Nouv. Guin. 1776, 85, pl. 48.

b. **Tantalus variegatus** *(1)* Scopoli, Del. Flor. et Faun. Insubr. 1786, II, 92, Nr. 78.

c. **Numenius luzoniensis** *(1)* Gm., S. N. 1788, I, 656; *(2)* Dresser, B. Europe VIII, 245 (1873); *(3)* Legge, B. Ceylon 1880, 911.

d. **Numenius phaeopus** (nec Linn.); *(1)* Pall., Zoogr. Rosso-As. 1811, II, 169; *(2)* S. Müll., Verh. Natuurk. Comm. 1839—43, 22; *(3)* id., Reize Ind. Archip. 1858, II, 13; *(4)* Schlegel, Mus. P.-B., Scolopaces, 1864, 97, pt.; *(5)* Wald., Tr. Z. S. 1872, VIII, 96; *(6)* Rosenb., Malay. Archip. 1878, 278; *(7)* Meyer, Ibis 1879, 142; *(8)* Rosenb., Zool. Garten 1881, 167; ? *(9)* Vorderman, N. T. Ned. Ind. 1884, XLIII, 119; *(10)* Steere, List Coll. B. & M. Philipp. 1890, 26; *(11)* Seeb., B. Japan 1890, 316; *(12)* Vord., N. T. Ned. Ind. 1891, L, 516; *(13)* id., Notes Leyd. Mus. 1891, 129; *(14)* id., N. T. Ned. Ind. 1895, LIV, 352.

e. **Numenius uropygialis** *(1)* Gld., P. Z. S. 1840, 175; *(II)* id., B. Austr. 1848, VI, pl. 43; *(3)* Salvad., Ann. Mus. Civ. Gen. 1876, IX, 63; *(4)* Meyer, Isis, Dresden 1884, 56; *(5)* Guillem., P. Z. S. 1885, 560; *(6)* Rams., Tab. List 1888, 20.

Numenius variegatus *(1)* Salvad., Ann. Mus. Civ. Gen. 1882, XVIII, 330; *(2)* id., Orn. Pap. 1882, III, 332; *(3)* Meyer, Isis 1884, 6; *(4)* W. Blas., Ornis 1888, 629; *(5)* Rams., Tab. List 1888, 20; *(6)* Everett, J. Str. Br. R. A. S. 1889, 209; *(7)* W. Blasius, J. f. O. 1890, 145; *(8)* Styan, Ibis 1891, 508; *(9)* Salvad., Orn. Pap. Agg. 1891, 204; *(10)* Wiglesw., Av. Polyn. 1892, 66; *(11)* De La Touche, Ibis 1892, 501; *(12)* Büttik., Notes Leyd. Mus. 1892, 204; *(13)* Meyer, t. c. 265; *(14)* M. & Wg., J. f. O. 1894, 252; *(15)* iid., Abh. Mus. Dresd. 1895, Nr. 8, p. 18; *(16)* Sharpe, Cat. B. 1896, XXIV, 361, 754.

f. **Numenius phaeopus variegatus** *(1)* Stejn., Bull. U. S. Nat. Mus. 1885, Nr. 29, p. 138; *(2)* Seeb., Distr. Charadr. 1887, 330; *(3)* Tacz., Faune Orn. Sib. Orient. 1893, II, 943.

"Krombek", (Dutch) Minahassa, Nat. Coll.

"Totupo", Gorontalo?, Rosenb. *d 6.*

"Bararang", Gt. Sangi and Siao, Nat. Coll.

"Bararanga" (a general name for Shore-birds), Talaut, iid.

For further synonymy and references cf. Salvadori *2, 9*; Stejneger *f 1*; Taczanowski *f 3*; Sharpe *16.*

Figure and descriptions. Gould *e II*; Salvadori *2*; Taczanowski *f 3*; Sharpe *16*; etc.

Adult (winter). Above dark brown (bistre), the feathers of mantle and scapulary region with pale edges, spreading out on the longer scapulars and tertiaries into ill-defined pale

brown notches, which are whiter and better defined on the secondaries and wing-coverts; a mesial stripe of whity-brown along the head above; hind-neck striated with pale brown; lower back and rump white, with subterminal heart-shaped or sagittate brown spots and dusky bases to the feathers; upper tail-coverts barred with brown and fulvous white or pale brown; tail hair-brown, crossed with about eight bars of darker brown; alula, primaries and their coverts blackish, the coverts and inner quills tipped with white, the outermost with the shaft white; superciliary stripe, face, neck, jugulum and breast fulvous, streaked with brown, brownest on ear-coverts, lores, and sides of breast; remaining under-parts whitish, clear on the middle of the abdomen, chin and upper throat, barred with rufous brown on sides, flanks and under tail-coverts; under wing-coverts and axillaries barred with hair-brown and white; "iris dark brown; bill brownish black, below at base reddish grey": Stejneger *f 1* (Main, Minahassa, 23. Febr. 1894: Nat. Coll. — C 13251).

Young. In the young the pale brown notches on the back, scapulars and wing-coverts of the adult have the form of round spots arranged in pairs on opposite sides of each feather; the bars on the tail are of about equal width (in the adult the dark bars are narrower); the mesial streak on the head above seems to be smaller (juv., Kema, 14. Sept. 1892: P. & F. Sarasin, and others).

Observation. There seems to be no particular difference between winter and summer plumage.

Moult. We have specimens moulting their remiges in November (Kabruang, C 13050) and February (C 13251). Others killed in April, May, June, July seem to have a perfect wing.

Measurements. Wing (in 26 expls. from the East Indies) 112—151 mm; tail ca. 80—100; tarsus ca. 58; middle toe with claw ca. 38; exposed culmen (straight) 77—100 mm. Probably the female is considerably larger than the male.

Eggs. Unknown *(f 2, f 3)*.

Distribution. East Siberia from Kamtschatka to Lake Baikal (Taczanowski *f 3*); Bering Id. (Stejneger *f 1*); Sakhalien (Nikolski *f 3*); Corea (Kalin. *f 3*); Japan (Blakiston, etc. *d 11*); China (Swinhoe *2*, etc.); Formosa (Swinhoe *2*); Philippines (Sonnerat, Everett *2*, Steere *d 10*, Platen *7*); Borneo (Schwaner, etc. *2, 6*); Sumatra (S. Müll., etc. *d 4, 2*); Java (Horsfield, Diard *d 4, 2*); Banka (v. d. Bossche *d 4, 2*); Billiton and Mendanau (Vorderman *d 12, d 13*); Lombok (Vorderman *d 14*); Sumba (Riedel, ten Kate *12, 13*); Flores (Semmelink *d 4, 2*, Wallace *16*); Timor (S. Müller *d 4, 2*); Celebes — Buton (S. Müller *d 2*), Bonthain (S. Müller *d 4*), Gorontalo Distr. (Rosenb. *d 8*), Minahassa (Forsten *d 4*, etc.), Manado tua (Meyer, Nat. Coll.), Mantehage and Banka (Nat. Coll.), Talissi (Guillemard *e 5*); Sangi Is. — Siao (Meyer *3*, Nat. Coll.), Gt. Sangi (Bruijn *e 3*, Platen *4*, Nat. Coll.); Talaut Is. — Kabruang (Nat. Coll. *13*); Sula Islands (Wallace *16*); Moluccas — Morty, Ternate, Tidore, Halmahera, Batchian, Buru, Ceram, Amboina, Ceramlaut, Goram (fide Salvadori *2*); Papuasia — Guebeh, Waigiou, Obi major, Salawatti, New Guinea, Timorlaut, Kei, Aru, Jobi, Admiralty Is., Duke of York, New Britain, Solomon Is., Yule Id., Is. of Torres Str. (fide Salvadori *2*); Mysol (Wallace and Rosenberg *16*); Australia and Tasmania (Ramsay *e 6*); Polynesia — New Caledonia, Fiji Is., Caroline Is., Pelew Is., Marianne Is. (f. Wiglesw. *10*).

The Eastern Whimbrel offers in some respects a case parallel to *Limosa novaezealandiae*, but in its winter migration it keeps more to the western side of the Pacific and to the East India Archipelago, and it is not known from New Zealand. Corresponding differences separate both from their Euro-Asiatic allies,

compared with which they may be said to have a more saturated coloration. Much as with *Limosa*, *N. variegatus* may be distinguished from *N. phaeopus* by its axillaries in which the white bars are not more than twice the width of the brown (usually the bars are of about equal width), while in the adult *N. phaeopus* the white bars are three or four times the width of the brown; also the under wing-coverts of *N. variegatus* are thickly barred and spotted with brown, while in *N. phaeopus* they are much whiter, the second and third rows being almost pure white; the lower back of *N. variegatus* is always white marked with large spots of brown, changing to bars on the rump and upper tail-coverts, whereas the lower back of *N. phaeopus* appears pure white and the spots only attain to the size of bars on the longer upper tail-coverts. Seebohm *(f 2)* says the two forms completely intergrade, but this is certainly not the case in 26 specimens of *variegatus* and two of *phaeopus* before us, though the birds vary much in size and coloration, both individually and with age and with the wearing-away of the feathers.

The Oriental Whimbrel apparently breeds in very high northern latitudes, for it is recorded only as a bird of passage by Dr. Stejneger from Bering Island, and by Taczanowski as such from Kamtschatka and other parts of East Siberia. Its breeding grounds have not yet been discovered, though Nikolski believes that it nests in Sakhalien. As to Celebes it seems to be a plentiful winter visitor, and some individuals remain all the year. We have a specimen from Manado tua and another from Banka killed in May, one from Siao in June, one from Great Sangi in July. Others are noted by Meyer in Legge's Birds of Ceylon (p. 912) as killed in May in Ternate and Waigiou, in June in New Guinea, in July in New Guinea, in August at Mactan in the Philippines.

341. ? NUMENIUS ARQUATUS (L.).

Common Curlew.

a. **Numenius lineatus** *(1)* Cuv., Règne An. 1829, I, 521; *(2)* Hume, Str. F. 1873, I, 237; *(3)* Legge, B. Ceylon 1880, 906; *(4)* Everett, J. Str. Br. R. A. S. 1889, 209; *(5)* Steere, Philipp. List 1890, 26; *(6)* Whitehead, Ibis 1890, 59; *(7)* Salvadori, Orn. Pap. Agg. 1891, 203.

Numenius arquatus *(1)* Jerd., B. Ind. 1864, III, 683; ?*(2)* Rosenb., Malay. Archip. 1878, 278; *(3)* Oates, B. Brit. Burmah 1883, II, 412; *(4)* Seebohm, B. Japan 1890, 314; *(5)* Sharpe, Cat. B. 1896, XXIV, 341, 753.

b. **Numenius arquatus lineatus** *(1)* Seebohm, Brit. B. 1885, III, 95; *(2)* id., Distr. Charadr. 1887, 324; *(3)* Tacz., Faun. Orn. Sib. Orient. 1893, II, 938.

For further synonymy and references cf. Salvadori *a 7*; Legge *a 3*; Sharpe *5*.

Descriptions. Legge *a 3*; Oates *3*; Seebohm *b 2* (diagn.); Salvad. *a 7*; Taczanowski *b 3*. Particulars of the skeleton have been figured by Giebel, Milne-Edwards and Garrod.

Diagnosis. Differs from *N. variegatus* by its much larger size (wing ca. 310 mm; tarsus ca. 85;

bill 140—203 [Seeb.]), and by its head above being pale striated brown (not blackish brown with a single pale streak along the middle).

Distribution. East Siberia (Dybowski, etc. *b 3*); Mongolia (David *b 3*); Kurile Is. (Steller *4*); Japan (Pryer *4*); Loochoo Is. (Cassin *4*); China (David, Swinhoe *a 7*, *b 3*); Formosa (Swinhoe *a 7*); India (Jerdon, etc. *a 3*); Ceylon (Legge, etc. *a 3*); Laccadives, Andamans and Nicobars (Hume, etc. *a 3*, *a 7*); Burmah (Oates, etc. *a 3*); Tenasserim (Davison *3*); Cochin China (f. Oates *3*); Malay Peninsula (f. Oates *3*); Sumatra, Java (f. Salvad. *a 7*); S. Borneo (Croockewit *a 4*); Palawan (Whitehd. *a 4*, *a 6*); Negros (Steere *a 5*); Halmahera (Leyden Mus. f. Schl. *a 7*); ? Celebes (Rosenb. *2*).

In the East the Curlew differs from the typical form of Europe, Africa, and Western Asia, according to Seebohm by having the lower back ordinarily white (not streaked with brown), the axillaries white (not spotted with brown), the margins of the scapulars and feathers on the upper back nearly white (as against grey in the western form) and the bill $5^1/_2$ to 8 inches (as against $4^1/_2$ to 7 inches), but he adds that "none of these characters are constant and intermediate forms are very common". It is interesting to observe that in this case it is the eastern form in which the lower back and axillaries are white, whereas in the Whimbrel this effect is produced in the western form, as also in the Bar-tailed Godwit. There is, however, some difference in their ranges, the Eastern Curlew being a more continental bird than *N. variegatus*, and it does not visit such high northern latitudes to breed. Its nest and breeding habits in Dauria are described by Godlewski, and its egg by Taczanowski *(b 3)*.

Dr. Sharpe does not consider the eastern form separable from the western, and this judgment we have accepted.

This species is included with a query among the birds of Celebes in virtue of its name being found in von Rosenberg's list *(2)*, which is unfortunately not to be relied upon without further proof. Prof. W. Blasius (Z. ges. Orn. 1886, 199) expresses the opinion that it was the next species, *N. cyanopus* Vieill., which the traveller met with; it is, however, at least as probable that Rosenberg was right in his determination of the bird, as the eastern form of *N. arquata (N. lineata)* is almost certain to occur in Celebes occasionally, if not regularly, in winter. One example has been recorded from Halmahera. Up to 1889 Dr. Croockewit alone had met with it in Borneo to Mr. Everett's knowledge; it was not known to Lord Tweeddale from the Philippines, but Mr. Whitehead *(a 6)* saw a few, and Dr. Steere records it from Negros. It seems to be a somewhat rare visitor to the Archipelago.

From *N. variegatus* its differences have been pointed out, *supra*; from *N. cyanopus* it may be distinguished by its white lower back and white axillaries.

342. NUMENIUS CYANOPUS Vieill.

Brown-rumped Curlew.

Numenius cyanopus *(1)* Vieill., Nouv. Dict. VIII, 306 (1817); *(2)* Gould, Hb. B. Austr. 1865, II, 277; *(3)* Rams., P. Z. S. 1877, 339; *(4)* Salvad., Orn. Pap. 1882, III,

330; *(5)* Seebohm, Ibis 1884, 34; *(6)* Mathew, Pr. L. Soc. N. S. W. 1885, 255; *(7)* W. Blasius, Z. ges. Orn. 1886, 199; *(8)* Seebohm, Distr. Charadr. 1887, 326; *(9)* Buller, B. New Zeal. 2nd. ed. 1888, II, 45; *(10)* Rams., Tab. List 1888, 20; *(11)* Everett, J. Str. Br. R. A. S. 1889, 210; *(12)* Seebohm, B. Japan 1890, 315; *(13)* Salvadori, Orn. Pap. Agg. 1891, 204; *(14)* De La Touche, Ibis 1892, 501; *(15)* Tacz., Faun. Orn. Sib. Orient. 1893, II, 940; *(16)* Sharpe, Cat. B. 1896, XXIV, 350, 753.

a. **Numenius australis** *(1)* Gould, P. Z. S. 1837, 155; *(II)* id., B. Austr. 1848, VI, pl. 42; *(3)* Schl., Mus. P.-B., Scol., 1864, 90; *(4)* Salvad., Cat. Ucc. Borneo 1874, 333.

b. **Numenius major** pt. *(1)* Temm. & Schl., Faun. Jap., Aves 1850, 110, pl. 66; *(2)* Steere, List Coll. B. & M. Philipp. 1890, 26.

c. **Numenius rufescens** *(1)* Gould, P. Z. S. 1862, 286; *(2)* Swinh., Ibis 1863, 410; *(III)* Gld., B. Asia VII, pl. 60 (1864).

d. **Numenius tahitiensis** (nec Gm.); *(1)* Swinhoe, P. Z. S. 1871, 410; *(2)* David & Oust., Ois. Chine 1877, 458.

For further synonymy and references cf. Salvadori *4, 13*; Taczanowski *15*; Sharpe *16*.

Diagnosis. Differs from *N. variegatus* by its much larger size and relatively much longer bill, by its lower back and rump being concolorous with the other upper parts viz. grey-brown with dark brown centres (not white with brown streaks), by the head above being grey-brown evenly streaked all over with dark brown (not dark brown with a light mesial stripe), and the feathers of the mantle, scapulars and lesser wing-coverts with blackish centres and paler edgings, giving a more varied appearance.

From *Numenius arquatus* it is distinguishable by its lower back and rump of varied browns concolorous with the upper parts (as against white pure or slightly spotted in that species).

Young. Presenting differences from the adults corresponding to those seen in *N. variegatus*. Taczanowski describes a young male as having the lower scapularies and the tertiaries with more regular and rounded spots (as against the deep notches of pale brown and fish-bone bars of dark brown in the adult), the lower back and rump wit large reddish drops scattered on a brown ground, the streaks of the under-parts much finer, etc. *(15)*.

Measurements.	Wing	Tail	Tarsus	Middle toe with claw	Exposed culmen (straight)
a. (C 8049) ad., Cebu (Schadenberg)	295	125	93	56	215
b. (C 6262) ad., Sumba (Riedel)	287	107	96	57	199
c. (C 12366) Australia	300	120	87	51	145

Eggs. Unknown.

Distribution. Coast of Alaska (fide Taczanowski *15*); East Siberia from Kamtschatka to the Wilui (trib. of Lena) and Corea to Lake Baikal (Taczan. *15*); Bering Id. (Wosnessenski & de Maack *15*); Japan (Blakiston & Pryer *12*); China (Swinh. *d 1*, David *d 2*, De La Touche *14*); Formosa (Swinhoe *c 2*); Philippines — Negros (Steere *b 2*), Cebu (Schadenberg); Borneo (Ussher, Croockewit *11*); N. Celebes — Gorontalo Distr. (Riedel *7*); Sumba (Riedel *13*); Moluccas — Halmahera, Buru, Amboina, Ceram-laut (Salvadori *4*); Papuasia — New Guinea, Yule Island (Salvad. *4*); Is. of Torres Str. (MacGill. *4*); Australia and Tasmania (Gould *a II, 2*, Ramsay *10*); New Zealand (Travers, etc. *9*).

Only one example of this Curlew is as yet known from Celebes; it was obtained by Dr. Riedel in the Gorontalo neighbourhood, as recorded by Prof.

W. Blasius. The breeding grounds of this species are unknown, but are probably situated in N. E. Siberia. Taczanowski mentions an example from Kamtschatka so young as to be incapable of making a great journey; one may assume, therefore, that it was bred in the vicinity. By a curious mistake the distinguished Polish ornithologist spoke of it as nesting in nearly all parts of Australia, and Gould suspected that it did so in the highlands of Tasmania. There is, however, no reason to doubt that the bird is an ordinary winter migrant to the southern continent, and if it ever breeds there the case must be exceptional. At present there seems to be no evidence whatever that it has ever done so. It is, however, of plentiful occurrence in the country. On the other hand, specimens from the East Indies, especially from the more western and southern islands, are extremely scarce, a circumstance which may be due to its ordinarily holding a more eastern and direct route to Australia, or to its passage across the Archipelago being very rapid. In New Zealand it occurs only as an occasional straggler (Buller *9*).

The closest affinities of this species seem to be with the North American *N. longirostris*, which, as Seebohm points out, may be distinguished by its uniform buff (not brown and white barred) axillaries, and by its rich buff under-parts unstreaked on the breast and belly.

ORDER CICONIIFORMES.

Under this name Dr. Gadow includes 4 suborders: *Steganopodes*, *Ardeae*, *Ciconiae*, and *Phoenicopteri*. The *Steganopodes*, consisting of the Gannets, Pelicans, etc., are at least in habits and external appearance further removed from the other three groups than the latter are from one another, and their short legs, webbed feet, and natatorial habits sufficiently distinguish them as an order for themselves.

The young of the *Ciconiiformes* are hatched helpless and are covered with neossoptile down; the groups possess also, as Gadow points out, the following characters: aquintocubital, oil-gland feathered, desmognathous, vomer complete, basypterygoid processes wanting, spina interna sterni wanting, only one pair of sterno-tracheal muscles; they are water or marsh birds, with swimming or wading feet. By the last-named character they differ from the *Accipitres*, and by the absence of the basipterygoid processes and the single pair of sterno-tracheal muscles from the *Anseriformes*.

SUBORDER CICONIAE.

Containing the Storks, Ibises and Spoonbills, differing pterylologically and anatomically from the *Ardeae* by the position of the old downs, neck-tracts,

simple hypotarsus, syrinx without muscles, intestinal convolutions, form and size of the spina externa, U-shaped furcula, without apophyses (Gadow, in Bronn's Kl. & Ordn. VI, Abth. 4, Vög. 1893, pt. 2, p. 141).

FAMILY IBIDAE.

The Ibises bear much resemblance to the Curlews, though Gadow considers there is little in common between the two forms but the arched bill, the tongue, and the schizorhinity. It should be added also that a corresponding summer and winter change of plumage is passed through by the Ibis (at least *Plegadis*) and certain *Limicolae*, such as *Limosa* and some Curlews. Some of the most striking differences between the two forms are the nostrils situated high, almost horizontally, on the maxilla of the Ibises, the nasal groove running down to the tip of the bill or nearly, more or less of the face usually bare, and the long hallux.

The long decurved bill is the best means of distinction between the Ibises and the Storks and Spoonbills.

GENUS PLEGADIS Kaup.

Culmen about 3 times as long as the cranium, arched, nostrils linear, situated high and nearly horizontally at the sides of the culmen in its basal fourth, nasal groove running to the tip of the bill; loral and periocular region naked; tarsus long, anteriorly transversely scutellated; toes long, middle toe and claw a little shorter than the tarsus, hallux with claw about half the length of the middle toe and claw; rectrices 12, about as long as the tarsus; wing rather large, the shorter secondaries about $^2/_3$ its length. Summer and winter plumage very different. Migratory.

Range: most of the temperate and tropical regions of the World.

343. PLEGADIS FALCINELLUS (L.).

Glossy Ibis.

a. **Tantalus falcinellus** *(1)* Linn., S. N. 1766, I, 241; *(2)* Rosenb., Malay. Archip. 1878, 278.

b. **Falcinellus igneus** *(1)* Gray, List Gen. B. 1841, 87; *(II)* Gould, B. Austr. 1848, VI, pl. 47; *(3)* Wald., Tr. Z. S. 1872, VIII, 101; *(4)* Salvad., Cat. Ucc. Borneo 1874, 361; *(5)* Elliot, P. Z. S. 1877, 503; *(6)* Vorderm., N. T. Ned. Ind. 1884, XLIV, 253; *(7)* Bennett, Pr. L. Soc. N. S. W. 1887, 1059; *(8)* Everett, J. Str. Br. R. A. S. 1889, 191.

c. **Falcinellus peregrinus** *(1)* Bp., Consp. 1855, 159; *(2)* Joest, Holontalo 1883, 105.

d. **Ibis falcinellus** *(1)* Schl., Mus. P.-B., Ibis, 1863, 2; *(2)* Finsch, Neu-Guinea 1865, 182; *(3)* Finsch & Hartl., Vög. O.-Afr. 1870, 730; *(4)* Heugl., Vög. N.-O.-Afr. 1871, 1132; *(5)* Hartl., Vög. Madag. 1877, 316; *(6)* David & Oust., Ois. Chine 1877,

455; *(7)* Rosenb., Zool. Garten 1881, 167; *(8)* Browne, Auk 1887, 97; *(9)* Ramsay, Tab. List. Austr. B. 1888, 20; *(10)* North, Nests and Eggs Austr. B. 1889, 396.

Plegadis falcinellus *(1)* Salvad., Atti Soc. It. Sc. Nat. Mil. 1864, VI; *(2)* id. (transl.), J. f. O. 1865, 315; *(III)* Fritsch, Vög. Europ. 1870, 378, t. 43, f. 3; *(IV)* Dresser, B. Europe VI, 335, pl. 409 (1878); *(5)* Legge, B. Ceylon 1880, 1109; *(6)* Salvad., Orn. Pap. 1882, III, 382; *(7)* Oates, B. Br. Burmah 1883, II, 271; *(8)* W. E. Clarke, Ibis 1884, 134, 147; *(9)* Brd., Brew. & Ridgw., Water B. N. Am. 1884, I, 94; *(10)* Oates ed. Hume's Nests and Eggs Ind. B. 1890, 231; *(11)* Büttik., Zool. Erg. Weber's Reise 1893, III, 284; *(12)* Newt., Dict. B. 1893, 456; *(13)* Sharpe, Cat. B. 1898, XXVI, 29.[1])

e. **Ibis falcinella** var. **peregrina** *(1)* Brügg., Abh. Ver. Bremen 1876, V, 98.

f. **Plegadis falcinellus** var. **peregrinus** *(1)* W. Blas., Z. ges. Orn. 1886, 170.

g. **Falcinellus falcinellus** *(1)* Rchw., Vög. Deutsch O.-Afr. 1894, 55.

"Mololoneo", Gorontalo Distr., v. Rosenb. *a 2*, Joest *c 2*.

"Swekko itam trompet", Malay, Minahassa; Nat. Coll. **"Pokok remdeng trompet"**, ib.; iid.

For further synonymy and references cf. Finsch & Hartlaub *d 3*; Heuglin *d 4*; Elliot *b 5*; Dresser *IV*; Legge *5*; Salvadori *6*; Sharpe *13*; etc.

Figures and descriptions. Plates in all the standard works on European birds; Gould *b II*; Legge *5*; Ridgway *9*; Sharpe *13*, etc.

Adult in breeding plumage. Forehead and crown glossy bronze-green; rest of head, entire neck, under-parts, scapulars (except the longest) and carpal region chestnut, lightest and brightest on the under-parts; remaining upper parts, under wing-coverts, axillaries, hind flanks and under tail-coverts dark metallic green, glossed with violet on the back and under tail-coverts, more bronze-green on wings, under wing-coverts and axillaries (Europe, Nr. 11736; Australia, Nr. 11726).

"Iris brown, in some mottled with grey; bill dark livid brown; facial skin livid, extending round the eye from the centre of the forehead and thence to the sides of the lower mandible; legs and feet bronzed brown, bluish above the knee" (Legge *5*).

Sexes. Similar in coloration, but the male is said to be larger on an average.

Young in first plumage. Dull brown, with but little gloss on the upper parts; head and neck finely streaked with white.

Adult in winter plumage. Head and neck earthy brown, finely streaked with white; upper parts as in summer — dark green glossed with purple and amethystine; jugulum, breast and abdomen earthy brown, with glossy purpurascent middles to the feathers, and pale terminal edgings (Lake Limbotto, January 1876: van Musschenbroek — C 5272; Tondano, Aug.—Sept. 1892: Nat. Coll. — C 10986).

Observation. Ornithologists are not generally aware, though the fact did not escape Naumann, nor recently Sharpe *(13)*, that this species has a winter plumage, birds in this dress having usually been taken for immature individuals. That the adult puts on a dress in winter resembling that of the young is proved by the above-described example from Limbotto, which is moulting and has the head, neck and breast with brown feathers mixed with the chestnut ones of breeding plumage, but the chestnut feathers are old and worn and the brown feathers new ones on the breast, and the brown-and-white ones on the neck and head — though not quite so new as those on the breast, are in much better condition than the chestnut ones.

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[1]) Dr. Sharpe has most obligingly sent us the proof-sheets of the Catalogue of the *Plataleae* and *Herodiones*.

Measurements.	Wing	Tail	Tarsus	Mid. toe with claw	Culmen (straight)
a. (C 5272) ad., Limbotto, Jan. 76 (Mussch.)	248	90	81	73	103
b. (C 10986) ad., Tondano, Aug.—Sept. (N. C.)	254	90	81	72	102
c. (Nr. 2191) ad., Ternate	286	—	102	79	127
d. (Nr. 11726) ad., Australia	292	—	—	—	—
Seven examples from Europe and N. Africa	255–300	—	84—108	—	—

Eggs. Elongated ovals as a rule, regularly pointed towards the small end, beautiful uniform blue, scarcely any tinge of green in any; shell very fine and compact (the pores being very inconspicuous), with a slight gloss (Hume *10*. See, also, W. E. Clarke *8*; Bennett *b 7*; North *d 10*; etc.).

Nest. "The nests were small and mostly made of twigs and grass-roots, almost flat in shape and placed upon the horizontal forks of small branches high up in the trees" — thorny trees growing in the half-dried bed of a small tank (Ceylon — Legge *5*, *10*).

Distribution. America — Eastern portion of the United States; Central and Southern Europe; Africa; Madagascar; Asia — Asia minor, Persia to the Indian countries, the East India Archipelago to New Guinea and Australia.

In Celebes: N. Peninsula — Minahassa (Nat. Coll.), Gorontalo Dist. (Forsten *d 1*, v. Rosenberg *a 2*, *e 1*, *d 7*, Riedel *f 1*, v. Musschenbr.), S. Peninsula — Macassar (S. Müller *d 1*), Tete Adji (Weber *11*).

The Glossy Ibis is a dweller in most of the temperate and warm countries of the globe. In South and Central America and the western parts of North America the typical form is represented by two closely allied species, *Plegadis guarauna* (L.) and *P. ridgwayi* (Allen), the first differing by its white face and ranging from the Western United States to the Argentine Republic, the latter, said to have shorter stouter legs and feet and some differences of intensity in colour, inhabiting Peru and Chili (see Ridgway's Manual N. Am. Birds 1887, 124). It is probable that *Plegadis falcinellus* also is not perfectly uniform in its characters throughout its vast range. Bonaparte separated the birds of Java and Celebes as *F. peregrinus* under the belief that they differed in colour. No proof of this has been found since, but Brüggemann and, later, W. Blasius have held them separate as a subspecies in virtue of their small size. The two Dresden specimens from Celebes are also small, but one from Ternate, which island lies nearly in sight of Celebes, is very large. Before they can be admitted as racially distinct in Celebes and Java, more specimens should be measured. It is also an open question at present whether the species is not simply a winter visitor to these islands.

In the Minahassa the Glossy Ibis appears to be of rather rare occurrence, but this is clearly not the case at Lake Limbotto, from where there are four or five examples obtained by Forsten in September and October, 1841, and where Rosenberg and his hunters shot 16 specimens in two months in 1863 and 1864; he speaks of it as very abundant. In Europe it is only a summer visitor — a straggler to the British Islands, Norway, Denmark, North Germany, Holland, Belgium and Northern France, but breeding plentifully in Hungary, and

said to breed in Spain (Dresser *IV*). The bird probably winters in Africa, where it is known nearly as far south as the Cape Colony. In India it is, as Legge points out, a cold-weather visitant, and it has not been recorded as breeding there, except in Sind. In Ceylon it is a resident. It is also known to breed in Australia.

In general appearance the Ibis, particularly *Plegadis*, calls to mind the Curlew. The present species dons a chestnut dress on the neck and breast in the breeding season like certain Shore-birds and Waders, to wit, the Godwits, the Grey Phalarope, one or more of the Stints, the Curlew-sandpiper, etc. Probably a position somewhere between the *Limicolae* and the Storks and Herons will not be far wrong for the Ibises.

FAMILY CICONIIDAE.

The Storks may be distinguished from the Herons by their having the hallux raised above the plane of the other toes instead of on a level with them; the claw of the middle toe is not pectinated. The straight Heron-like bill distinguishes them at once from the Ibises and Spornbills. See, also, *supra*, *Ciconiae*.

GENUS DISSOURA Cab.

Size large; bill about 3 times as long as the head, large, straight, pointed, nostril in the basal fourth, linear; face naked, the skin leaden in colour, neck covered with down, without contour-feathers; tail a little longer than the tarsus, the lateral upper tail-coverts lengthened, forming a strong lyre-shaped support to the rectrices; lower half of tibia and tarsus naked, reticulated; the tarsus twice as long as the middle toe and claw; wing large, the inner secondaries about as long as the primaries, the shorter secondaries about $^1/_3$ shorter. The genus is found in Africa, and from India to Celebes.

344. DISSOURA EPISCOPUS (Bodd.).

White-necked Stork.

a. **Ardea episcopus** *(1)* Bodd., Tabl. Pl. Enl. 1783, p. 54.
b. **Ardea leucocephala** *(1)* Gm., S. N. 1788, I, 642.
c. **Ciconia leucocephala** *(1)* Horsf., Tr. L. S. 1821, XIII, 188; *(2)* Schl., Mus. P.-B., Ciconiae, 1864, 9; *(3)* Rosenb., Malay. Archip. 1878, 235, 278.
d. **Ciconia episcopus** *(1)* G. R. Gray, Gen. B. III, 561 (1848); *(2)* Hartl. & Finsch, Vög. O.-Afr. 1870, 722, pt.; *(3)* Heugl., Vög. N.-O.-Afr. 1871, 1108, pt; *(4)* Rchw., J. f. O. 1877, 168.
e. **Ciconia microscelis** *(I)* G. R. Gray, Gen. B. 1848, III, 561, pl. 151; *(II)* Rchb., Grallat., 1851, t. 144, f. 2388.
f. **Sphenorhynchus umbellata** *(I)* Rchb., Grallat. 1852, t. 165, f. 456.
g. **Melanopelargus episcopus** *(1)* Blyth, Ibis 1867, 172; *(2)* Wald., Tr. Z. S. 1872, VIII, 101;

(3) Adam, Str. F. 1873, I, 398; *(4)* Ball, ib. 1874, II, 433; *(5)* Salvad., Ucc. Borneo 1874, 356; *(6)* Hume & Davis., Str. F. 1878, VI, 469; *(7)* Tweedd., P. Z. S. 1878, 344, 953; *(8)* Meyer, Ibis 1879, 144, 146; *(9)* Sharpe, t. c. 272; *(10)* W. Blas., J. f. O. 1882, 254; *(11)* id., Verh. z.-bot. Ges. Wien 1883, 72; *(12)* id., J. f. O. 1883, 140; *(13)* Vorderm., N. T. Ned. Ind. 1885, XLIV, 239; *(14)* W. Blas., Ztschr. ges. Orn. 1886, 170; *(15)* Everett, J. Str. Br. R. A. S. 1889, 191; *(16)* Steere, List Coll. B. & M. Philipp. Is. 1890, 27; *(17)* Bourns & Worces., B. Menage Exp. 1894, 32; *(18)* Grant, Ibis 1895, 267; *(19)* P. & F. Sarasin, Z. Ges. Erdk. Berlin 1895, 333; *(20)* M. & Wg., Abh. Mus. Dresden 1896, Nr. 1, p. 15.

Dissoura[1] **episcopus** *(1)* Salv. & Scl., Ibis 1878, 477; *(2)* Hume, Str. F. 1879, VIII, 71; *(3)* Vidal, t. c. 173; *(4)* Legge, B. Ceylon 1880, 1119; *(5)* Vidal, S. F. 1880, IX, 88; *(6)* Butler, t. c. 433; *(7)* Reid, ib. X, 1881, 74; *(8)* Oates, t. c. 1882, 243; *(9)* Davis., t. c. 1883, 416; *(10)* Oates, B. Brit. Burmah 1883, II, 265; *(11)* Brd., Brew. & Ridgw., Water B. N. Am. 1884, I, 77; *(12)* C. Swinh., Ibis 1885, 135; *(13)* Heine & Rchw., Nomencl. Mus. Hein. 1890, 311; *(14)* Oates ed. Hume's Nests and Eggs Ind. B. 1890, III, 268; *(15)* Hart., Nov. Zool. 1896, 598.

"Timbao" [Gorontalo Distr.], Rosenberg *c 3*. **"Swekko burung taon"**, Minahassa, Nat. Coll.

For further synonymy and references [excluding the African form] cf. Hartlaub & Finsch *d 2*; Heuglin *d 3*; Salvadori *g 5*; Oates *10*.

Figures and descriptions. Gray *e I*; Reichenbach *e II*, *f I*; Schlegel *c 2*; Legge *4*; Oates *10*; Vorderman *g 13*; etc.

Adult. Black, glossed with metallic green, some steel-blue on the back; breast glossed with auricula-purple; lower breast, thighs anteriorly, sides and under wing-coverts dusky glossed with green; abdomen, thighs behind, and tail-feathers white; neck clothed with white down; crown and nape glossy blue-black; skin of face, and sides of upper neck bare, "leaden" (Legge), forehead covered with a little down (♂, Lake Posso, Central Celebes, 12. Febr. 1895: P. & F. Sarasin).

The upper tail-coverts are much lengthened laterally, forming a strong fork, reaching nearly to the end of the rectrices.

"Iris scarlet, with a yellow disk in the sclerotic or space surrounding the iris; bill black, changing to red at the tips of both mandibles, margins red; . . . legs and feet dusky red, the edges of the webs whitish; . . bare skin along the ulna vermilion-red" (Legge *4*).

Young. In the first plumage the sides of the head are feathered, and the neck, though clothed in white down, shows also blackish brown feathers, but which fall out in proportion as the down-feathers increase in extent (Schlegel *c 2*; see also Legge *4*, W. Blasius *g 10*).

Measurements.	Wing	Tail	Tarsus	Mid. toe and claw	Exposed culmen
a. (Nr. 3199) ad., N. Celebes, 1871 (Meyer) . .	485	200	165	81	139
b. (C 2010) ♀ ad., Limbotto, July 71 (Meyer) .	490	190	172	—	157
c. (C 13273) ad., Main, Minahassa, Feb. 94 (Nat. C.)	490	205	168	85	137
d. (C 13861) ad., Malalajang, Minah., Nov. 94 (iid.)	485	185	174	89	151
e. (Sarasin Coll.) ♂ ad., Lake Posso, Feb. 95 .	475	205	162	83	146
For comparison: *D. pruyssenaeri:*					
(C 5824) ad., W. Africa (v. Koppenfels) . . .	455	185	145	88	138
(C 15906) ad., "Abyssinia"	490	234	154	88	140

[1] Also spelt *Dissura* by many ornithologists, but *Dissoura* is the original of Cabanis (cf. Reichenow *d 4*).

Eggs. "The eggs in my collection from East India are considerably smaller than those of our *Ciconia alba*, but resemble them in structure. They measure 60—65 × 47 mm" (Nehrkorn MS.). Four eggs make up the sitting. They are said by Hume to vary much in shape and when perfectly fresh to be of a faintly bluish white, or, held against the light, of a delicate pale green. See, also, Bocarmé *c 2*.

Nest. In large trees; "they are densely built of twigs and small branches, and have a considerable central depression, sometimes thinly lined with down and feathers, and sometimes almost filled with straw, leaves and feathers, in amongst which the eggs are sunk as if packed for travelling" (Hume *14*).

Distribution. India (Jerdon, etc. *g 5*, *4*, *14*); Ceylon (Legge, etc. *4*); Burmah (Oates, etc. *10*); Tenasserim (Davison *g 6*); Malay Peninsula (Blyth *2*); Sumatra (Wagler *g 5*); Java (Horsfield *c 1*, de Bocarmé *c 2*, etc.); Lombok (Everett *15*); Borneo (Treacher *g 9*, Platen *g 10*, Grabowski *g 11*, *g 15*); Philippine Islands (Everett *g 7*, Steere *g 16*, Bourns & Worcester *g 17*, Whitehead *g 18*); Celebes — Minahassa (Meyer *g 8*, Nat. Coll.), Gorontalo Distr. (Riedel *g 14*, Meyer *g 8*), Saussu River, Tomini Gulf (Rosenberg *c 2*, *c 3*), Togian Id. (Meyer *g 8*), Lake Posso (P. & F. Sarasin *g 19*, *g 20*).

The White-necked Stork also inhabits Africa under a form which differs slightly from that of the Indian countries, and which seems worthy of specific or subspecific distinction. The bird from the White Nile was named *Ciconia pruyssenaeri* by Heuglin, who afterwards withdrew the name, but our two specimens from West Africa and Abyssinia are recognisable as distinct from *D. episcopus* of India by the black feathers of the occiput having a mesial terminal streak of white in them, and those of the nape white like the neck, but the feathers of the nape are contour-feathers and not down as on the neck. The down on the face and forehead is for the most part black; in *D. episcopus* it is white. The toes also seem to be longer when compared with the tarsus.

Dissoura episcopus is not often found in the Minahassa, according to Meyer's observations, but is not rare in the Gulf of Tomini. It has not yet been recorded from South Celebes, but the cousins Sarasin found it an inhabitant of Central Celebes on the marshy ground at the southern end of Lake Posso. It is probably a constant resident in the island, which marks, so far as is known, the easternmost bounds of its range.

In many respects *Dissoura* is a curious bird. The neck of the adult is clothed in white down; the contour-feathers are here wanting, but they are produced (at least to some extent) in the young bird, which no doubt displays a more ancestral condition in this respect. The face is naked save for a very little down, but on the head there is a sort of skull-cap of normal contour-feathers. The Storks and Ibises in general appear as if they were undergoing the process of becoming bald about the head and neck, as witness the Adjutants (*Leptoptilus*), the Jabiru (*Mycteria*), *Tantalus*, *Geronticus*, *Threskiornis*, etc. The skull-cap of *Dissoura* has all the appearance of being a remnant of the original covering of the head and neck of the bird. Whilst it has lost feathers on the head and neck, it has developed in size those of the tail, the lateral upper —

not "under" as Reichenow *(d 4)* says — tail-coverts being very long, forming a lyre-shaped fork reaching to within an inch of the tip of the tail-feathers and evidently affording the tail much support at the sides by their stiffness. On the under side of the ulna the skin is bare, and in life, as Rosenberg and others observe, brilliant red in colour. Its habits and nidification are described by de Bocarmé *(c 2)*, Legge *(4)*, Hume *(14)*, and others. As to its food, it appears to be to a large extent insectivorous, though frogs, snails and reptiles probably form its chief sustenance. For the African form Heuglin furnishes the following list of what it eats: bees, grasshoppers, dragon-flies, caterpillars, beetles, frogs, crabs, snails, reptilia and mice.

FAMILY PLATALEIDAE.

The Spoonbills are easily distinguishable from the Storks, Herons, etc., by their bill, which is flat, long, narrow at the base and middle, and broadened into a large spoon-shaped end; the general plumage is white (in one American form washed with rosy, in parts crimson), and more or less of the head is naked.

GENUS PLATALEA L.

Dr. Sharpe (Cat. B. 1897, XXVI, 43) recognises 3 genera, the American *Ajaja* differing from *Platalea* by its entirely bare head and partially crimson plumage, the Australian *Platibis* by its having the nostrils situated in a deep groove with lateral ridges. *Platalea* is nearly cosmopolitan. (See, also, Grant, Ibis 1889, 32—58, pl. I).

345. PLATALEA sp.

Spoonbill.

a. **Platalea** *(1)* Rosenb., Malay. Archip. 1878, 235.
b. **Platalea luzoniensis** *(1)* Rosenb., t. c. 278; *(2)* W. Blas., J. f. O. 1883, 126.

Touching the occurrence of a Spoonbill in Celebes von Rosenberg wrote: "During my residence at Lake Tondano I received the bill of an example of this genus shot several years before in the rice-fields of the village of Langowan. I myself saw the bird at Saussu, but could not get within gun-shot. Moreover, there are several examples in the Leyden Museum killed in the neighbouring Sulla Islands". Mr. Büttikofer, after going over the material in the Leyden Museum, has, however, informed us that there is no *Platalea* whatever from Sula in that collection and that he is quite unable to say from where von Rosenberg got his knowledge. Rosenberg describes his encounter with the species at Saussu as follows: "Sailing along close to the coast, on the following day I saw on a sandbank at the mouth of the Saussu River a large Heron *(Ardea goliath)*,

and on the broad muddy bank, left dry by the ebb, swarms of white Herons *(Ardea garzetta)*, Spoonbills *(Platalea)*, white-necked Storks *(Dissoura episcopus)* and small shore-birds. I could not possibly withstand this sight, gave orders to anchor, was put ashore and was so fortunate as to kill two splendid examples of the Stork with both barrels. At the report the remaining birds took to flight with loud cries, and for a long time afterwards I saw the beautiful Spoonbills describing wide circles in the air at an unattainable height, until the falling darkness removed them from my eyes. In the hope of getting another couple of lucky shots next morning, I remained there. At sunrise indeed the birds made their appearance, but were so shy that it was impossible to approach within range".

The species was most likely *Platalea melanorhyncha* Rchb., known from Timor and Australia and straggling to New Zealand, or *P. intermedia* Grant, from New Guinea and Borneo. The plumage is, of course, white, and Mr. Ogilvie-Grant (Ibis 1889, 52, pl. I) distinguishes *Platalea intermedia* from *melanorhyncha* by its having "the naked skin of the forehead and throat, as well as the culmen, intense black, without any yellow spots above the eyes, and the spatule rounded, instead of being obtusely truncate". The primaries with black tips. The birds seen by Rosenberg might also have been *P. minor* T. & S. of China and Japan, or even *P. major*, which ranges from Egypt and India to Japan. It is impossible to say what Spoonbills may ultimately be found in Celebes.

SUBORDER ARDEAE.

Two remarkable African species, the Hammer-head, *Scopus umbretta*, and the Shoe-bill, *Balaeniceps rex*, represent distinct families or subfamilies of the Herons. *Scopus* seems to be in many respects intermediate between the true Herons and the Storks, while *Balaeniceps*, though perhaps standing nearer to the true Herons, differs from them in some important characters, such as its enormous bill, furnished with a praemaxillary hook, its havnig no powder-down patches on the ventral surface, no serrations on the middle claw, the tongue much reduced, etc. (see Gadow, in Bronn's Kl. & Ord. VI, 4, Aves II, 137, 139). The remaining forms constitute the family *Ardeidae*.

FAMILY ARDEIDAE.

The true Herons may generally be distinguished at a glance from most other birds by the long neck, legs, and straight, pointed bill; on the ground they walk with a sedate, elastic stride, rarely, or never, running (wherein they differ from the Rails, etc.); in flight they are characterized by the ample, slowly moving wings and the feet stretched out far beyond the short tail. The forms most like them in general appearance are the Storks and, in some ways, the

Cranes. The hallux of the Herons not raised above the plane of the other toes, and the pectinated middle claw serve to distinguish them from the Storks, which differ also in many anatomical characters (see, *supra*, *Ciconiae*); while the Cranes, among other differences, are nidifugous or able to run about almost immediately after leaving the egg, thereby showing their affinity with the Rails, etc., whereas the Herons are hatched helpless and are fed by the parents for a long time in the nest.

GENUS PHOYX Stejn.

The Purple Herons differ from the Herons of the genus *Ardea* by their longer toes, the middle one being with the claw about equal to the tarsus; by the upper two-thirds of the tarsus in front being covered with transverse shields, instead of with irregular scales; by the hind claw being more than half as long as the joint of the hallux. Two species or races are known.

Range: Europe — chiefly the Southern and Central countries; Africa; Madagascar; Asia (excluding Siberia, at least N. E., and Japan) as far as Celebes.

346. PHOYX MANILENSIS (Meyen).

Oriental Purple Heron.

a. **Ardea purpurea** var. **manillensis** *(1)* Meyen, Acta Acad. Leop. Carol. 1833, XVI, Suppl. p. 102; *(2)* id., Reise um d. Erde 1831, III, 226.

b. **Ardea purpurea** (nec Linn.); *(1)* Hume, Ibis 1869, 238; *(2)* Meyer, J. f. O. 1873, 405; *(3)* Salvad., Cat. Ucc. Borneo 1874, 345, pt.; *(4)* Hume, Str. F. 1874, II, 303; *(5)* Wald., Tr. Z. S. 1875, IX, 236; *(6)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 680; *(7)* Brügg., Abh. Ver. Bremen 1876, V, 96; *(8)* Lenz, t. c. 380; *(9)* David & Oust., Ois. Chine 1877, 438; *(10)* Hume & Dav., Str. F. 1878, VI, 472; *(11)* Rosenb., Malay. Archip. 1878, 278; *(12)* Hume, Str. F. 1879, VIII, 158; *(13)* Meyer, Ibis 1879, 143, 146; *(14)* Salvad., Ann. Mus. Civ. Gen. 1879, XIV, 253; *(15)* Legge, B. Ceylon 1880, 1132; *(16)* Rosenb., Zool. Garten 1881, 167; *(17)* W. Blas., Verh. z.-b. Ges. Wien 1883, 71; *(18)* Joest, Das Holontalo 1883, 106; *(19)* Oates, B. Brit. Burmah 1883, II, 245; *(XX)* Meyer, Vogelskel. 1884, I, t. LXXIII; *(21)* W. Blas., Ztschr. ges. Orn. 1885, 315; *(22)* Vord., N. T. Ned. Ind. 1885, XLIV, 233; *(23)* Büttik., Notes Leyden Mus. 1887, 80; *(24)* Stejn., Pr. U. S. Nat. Mus. 1887, X, 311; *(25)* Platen, Gefied. Welt 1887, 206; *(25bis)* Everett, J. Str. Br. R. A. S. 1889, 188; *(26)* Sharpe, Ibis 1890, 146, 285; *(27)* Oates ed. Hume's Nests & Eggs 1890, III, 235; *(28)* Steere, List Coll. B. & M. Philipp. 1890, 26; *(29)* Hagen, T. Ned. Aard. Genoots. 1890, (2) VII, 166; *(30)* Styan, Ibis 1891, 327, 491; *(31)* Salvad., Ann. Mus. Civ. Gen. 1891—92, (2) XII, 76, 141; *(31bis)* De La Touche, Ibis 1892, 488; *(32)* Hose, Ibis 1893, 420; *(33)* Büttik., Zool. Erg. Weber's Reise 1893, III, 283; *(34)* Bourns & Worces., B. Menage Exped. 1894, 31; *(35)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 18; *(36)* P. & F. Sarasin, Z. Erdk. Berlin 1895, XXX, 353.

c. **Ardea manillensis** *(1)* Sharpe, Ibis 1894, 427.

Phoyx manillensis *(1)* Sharpe, Ibis 1894, 431; *(II)* id., Cat. B. 1898, XXVI, 63,

pl. I; *(3)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 15; *(4)* Hart., Nov. Zool. 1896, 164.

"Tomeo", Gorontalo Distr., Rosenb. *18*, Joest *24*.

"Swekko burik besar", Malay in the Minahassa, Nat. Coll.

"Pokok werreng sela", Minahassa, iid.

"Kondor karro", South Celebes, Platen *27*.

For further references cf. Sharpe *II*.

Figures and descriptions. Sharpe *II*; Meyer *b XX* (skeleton); Legge *b 21*; Oates *b 25*; Vorderman *b 28*; etc.

Adult male. Head above slaty black, two feathers on the occiput lengthened to c. 140 mm; chin and upper throat white; neck and sides of head rufous chestnut, three slaty black stripes, whereof two extending from gape, over ear-coverts, down the neck on either side, the third from nape half-way down the hind neck, the last becoming cinereous and spreading out on lower hind neck into lengthened filamentous feathering; upper-parts slate-grey, browner on the wing-coverts, the lower scapulars much lengthened and shreddy, cinereous, the longest cinnamon-rufous; gorget of lengthened, pointed feathers rufous, blackish, and white, the longest white; breast, abdomen and under tail-coverts dark slate, strongly inclining to maroon-purple on breast and sides thereof, rufous and whitish towards base of under tail-coverts; sides, flanks and axillaries dark cinereous; thighs, under wing-coverts and carpal and metacarpal edge cinnamon-rufous or rufous chestnut; remiges below slate-grey, the three or four outermost with a shallow notch on the inner web (♂ ad. Lake Posso, Central Celebes, 14. Feb. 1895: P. & F. Sarasin).

"Iris yellow; bill above brown-black, below yellow [including much of upper bill]; feet black-brown" (Platen *b 27*).

Adult female. Very similar to the male; the two long occipital feathers are absent or nearly absent (♀ ad. Kema, 21. Aug. 1892: P. & F. Sarasin).

Young. Very different from the adult: head above blackish; sides of head, occiput, upper neck and wing-coverts cinnamon; lower neck and upper-parts brown with cinnamon tips and edgings; wings and tail brownish slaty; chin and upper throat white; fore neck pale cinnamon, streaked with dark brown; breast and abdomen pale cinnamon, the breast with dusky edgings; sides of body dark grey; metacarpal edge rufous (juv. Tondano Distr., Aug.—Sept. 1892: Nat. Coll. — C 10965).

Measurements.

	Wing	Tail	Tarsus	Middle toe with claw	Exp. Culmen
a. (Sar. Coll.) ♂ ad., Lake Posso, 14. II. 95 . . .	380	146	140	138	136
b. (Sar. Coll.) ♂ ad., Lake Posso, 13. II. 95 . . .	362	134	135	—	124
c. (Sar. Coll.) ♀ ad., Kema, 21. VIII. 92. . . .	372	142	133	132	140
d. (Sar. Coll.) [♂] ad., Kema, 16. VIII. 92 . . .	356	130	129	125	123
e. (C 10949) ad., near Manado, VIII.—IX. 92 (N. C.)	378	137	134	134	124
f. (C 10964) ad., Tondano Distr., VIII.—IX. 92 (N. C.)	382	135	125	127	124
g. (C 5267) ad., Limbotto, Jan. 76 (v. Mussch.) . .	344	—	—	—	128
h. (C 10965) juv., Tond. District, VIII.—IX. 92 (N. C.)	360	128	123	130	118

Eggs. 3; ovate to oval; glossless, somewhat rough and porous; whitish blue with a tinge of green; size 52—55 × 40—42 mm (Mapane, Gulf of Tomini, 28. Feb. 1895: P. & F. Sarasin).

Nest. Resembles [in construction] a Common Heron's nest (Mapane — P. & F. Sarasin).

Hume and others describe the bird as building on platforms made by bending down the tops of the rushes in ponds or jheels, laying 4 eggs, sometimes 5, on nests of twigs. Some favorite nest-sites mentioned by Legge and Dresser are on screw-pines, on the ground in marshy localities, or on floating islands of aquatic herbage.

Distribution. China (Swinhoe, David, etc. *b 3*, *b 9*); India (Jerdon, etc. *b 15*); Ceylon (Legge, etc. *b 15*); Andamans and Nicobars (Davison *b 4*); Burmah (Oates *b 19*); Tenasserim (Davison *b 10*); Malay Peninsula (Hume *b 12*); Sumatra (Beccari *b 14*, Klaesi *b 23*, etc. *b 29*, *b 30*); Engano (Modigl. *b 31*); Java (Horsfield *b 3*, Vorderman *b 22*); Borneo (Schwaner, etc. *b 3*, *b 25bis*, *b 26*, *b 32*); Philippine Is. (Meyen *a 1*, *b 5*, Steere *b 28*, Bourns & Worcester *b 34*); Celebes: — N. Peninsula (Rosenb. *b 11*, *b 16*, Meyer *b 2*, *b 13*, etc. *b 7*, *b 35*), Mapane, Gulf of Tomini, (P. & F. Sarasin), Lake Posso (P. & F. Sarasin), Tampira River, East Celebes (P. & F. Sarasin), S. Peninsula — Tjamba Distr. and Maros (Platen *b 21*), Tempe (Weber *b 33*), Bulekomba (Everett *4*).

The first examples of Purple Heron from Celebes of which there is notice were obtained in the Gorontalo District by von Rosenberg in 1863—64, and Meyer found it to be very plentiful in the Northern Peninsula and Gulf of Tomini in 1870—71. Dr. Platen and Prof. Weber met with it in the Southern Peninsula, and the cousins Sarasin discovered it at Lake Posso on their expedition through Central Celebes and got a clutch of three eggs at Mapane. Later, they encountered it when passing through splendid virgin forest down the Tampira River in East Celebes (Z. Ges. Erdk. Berlin 1896, 355). The bird is evidently a resident.

Dr. Sharpe *(c 1)*, unlike Prof. W. Blasius *(b 21)* and others, divides *Phoyx purpurea* into an eastern and western race or species, the former of which bears the name *P. manilensis* Meyen and inhabits the localities China and India to Java and Celebes as specified above, while the typical *P. purpurea* is stated to belong to other more western parts of Asia, Central and Southern Europe, and Africa. The eastern form, *P. manilensis*, according to Sharpe, is "distinguished by its uniform chestnut throat and fore neck, which has scarcely any black streaking at all, by the much more distinct lateral black streaks on the neck, by the slaty black colour of the chest, abdomen and under tail-coverts" *(II)*.

This handsome species may be easily recognised (when adult) among the other Herons occurring in Celebes by its blackish slate belly taking a strong maroon-purple tinge on the breast, and by its chestnut-rufous neck with a black stripe down each side of it and across the face, and a third one behind. Its toes are long, the middle one being sometimes a little longer, sometimes a little shorter than the tarsus; the tarsus is not reticulate-scaled in front (except near the joints) but encased in large oblique scales. The Purple Heron seems to have no very close allies. The subgenus *Phoyx* was made for it by Dr. Stejneger in his Review of Japanese Birds (Pr. U. S. Nat. Mus. 1887, X, 311).

GENUS ARDEA L.

The typical Herons are of large size, particoloured (except one American species, which is white), furnished with a crest and jugular tuft of elongated feathers, the bill long, straight, terminally serrated; the toes large, about two-thirds the length of the tarsus. The proportions of the toes and tarsus serve to distinguish *Ardea* from *Phoyx*, the serrated bill from *Notophoyx* and *Demiegretta*, the same character and the coloured plumage from *Herodias*.

347. ARDEA SUMATRANA Raffl.

Great Slaty Heron.

Ardea sumatrana *(1)* Raffl., Tr. L. S. 1822, XIII, 325; *(2)* Gould, Hb. B. Austr. 1865, II, 296; *(3)* Wald., Tr. Z. S. 1872, VIII, 98; *(4)* Salvad., Cat. Ucc. Borneo 1874, 344; *(5)* Brügg., Abh. Ver. Bremen 1876, V, 464; *(6)* Rchw., J. f. O. 1877, 267; *(7)* Hume, Str. F. 1878, VI, 469; *(8)* id., 1879, VIII, 158; *(9)* Sharpe, P. Z. S. 1881, 800; *(10)* Kelh., Ibis 1882, 192; *(11)* Salvad., Orn. Pap. 1882, III, 340; *(12)* Oates, B. Brit. Burmah 1883, II, 244; *(13)* Sclat., P. Z. S. 1883, 52, 200; *(14)* H. O. Forbes, ib. 1884, 434; *(15)* Meyer, Isis, Dresden 1884, 6, 56; *(16)* Nehrk., J. f. O. 1885, 35; *(17)* W. Blas., Z. ges. Orn. 1886, 201; *(18)* Rams., Tab. List 1888, 21; *(19)* Sharpe, Ibis 1888, 203; *(20)* W. Blas., Ornis 1888, 320, 638; *(21)* Hartert, J. f. O. 1889, 379; *(22)* Everett, J. Str. Br. R. A. S. 1889, 188; *(23)* North, Nests & Eggs B. Austr. 1889, 317; *(24)* Whitehd., Ibis 1890, 60; *(25)* Sharpe, t. c. 146, 285; *(26)* Hagen, T. Ned. Aard. Genoots. 1890, (2) VII, 166; *(27)* Vorderm., N. T. Ned. Ind. 1890, XLIX, 417; *(28)* Salvad., O. P. Agg. 1891, 205; *(29)* Meyer, J. f. O. 1892, 264; *(30)* Newton, Dict. B. pt. II, 1893, 418; *(31)* Hose, Ibis 1893, 420; *(32)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 18; *(33)* Sharpe, Cat. B. 1898, XXVI, 68.

a. **Ardea typhon** *(1)* Temm., Pl. Col. Nr. 475 (1829); *(2)* Schl., Mus. P.-B., Ardeae, 1863, 3; *(3)* Rosenb., Malay. Archip. 1878, 278; *(4)* id., Zool. Gart. 1881, 167; *(5)* W. Blas., J. f. O. 1883, 126; *(6)* Vorderm., N. T. Ned. Ind. 1885, XLIV, 233.

b. **Ardea rectirostris** *(1)* Gould, P. Z. S. 1843, 22; *(II)* id., B. Austr. 1848, VI, pl. 54.

c. **Ardea goliath** "Temm. ex ins. Celebes"; *(1)* Bp., Consp. 1855, II, 110; *(2)* Rosenb., Malay. Archip. 1878, 235, 241.

d. **Typhon robusta** et **sumatrana** et **rectirostris** *(1)* Bp., Consp. 1855, II, 110.

e. **? Leptoptilus javanicus** *(1)* Sharpe, Ibis 1879, 272 (eggs); *(2)* Hume, Str. F. 1880, IX, 235.

"Swekko sapie", Minahassa, Nat. Coll.

"Pemmaro", Siao, iid.

For further synonymy and references cf. Salvadori *11*.

Figures and descriptions. Temminck *a I*; Gould *b II, 2*; Schlegel *a 2*; Hume *7*; Salvad. *11*; Oates *12*; Vorderman *a 6*; Sharpe *33*.

Adult. Above dark slate-grey, with brown or violet reflections according to the light on the back; neck browner; the feathers of the head above, lower neck and some of the scapulars much lengthened and pointed, whitish ashy; remiges and tail-feathers slaty, wing-coverts (especially the lesser series) browner; carpo-metacarpal edge white; sides of head and of upper neck greyish brown; chin and upper throat

white; a blackish plait-like stripe down the middle of fore-neck for ca. 1/3 its length; breast and under-parts smoke grey, with a fulvous tint on the abdomen, most of the feathers with white shaft-streaks; "iris gold-yellow" (P.& F. Sarasin); legs and feet in the skin leaden blackish, bill blackish, the tip, under surface and base of lower mandible yellowish (ad., Banka Id., Minahassa, 20. V. 93: Nat. Coll. — C 12117).

Immature. Browner and less dark slaty than the adult; the lanceolate whitish feathers of the occipital crest and lower neck little developed, only one or two present on the scapulars; wing-coverts fulvous brown; neck and under-parts fulvous brown, varied with slaty and with white centre-streaks (juv., Banka, 16. V. 93: Nat. Coll. — C 12118).

Measurements.

	Wing [1]	Tail	Tarsus	Middle toe with claw	Exp. culmen
a. (C 12117) ad., Banka Id., 20. V. 93 (Nat. Coll.) .	500	185	175	125	174
b. (C 14145) ad., Lembeh Id., 10. III. 95 (iid.) . .	495	190	168	120	168
c. (Sarasin Coll.) vix ad., near Lembeh Id., 27. VII. 92	455	165	165	115	160
d. (C 885) ad., Siao (Meyer)	475	185	160	115	170
e. (C 12629) vix ad., Siao, July 93 (Nat. Coll.) . .	470	170	165	120	167
f. (C 12118) juv., Banka, 16. V. 93 (iid.)	460	160	158	120	155

Eggs and nest. "The nest observed by Gilbert was built in an upright fork of a large and lofty *Melaleuca* at about eighty feet from the ground, and was formed of an outer layer of very strong sticks, with a few small twigs as a lining, and contained two eggs of a light ash-grey" (Gould *b II, 2*).

Distribution. Arrakan (Blyth *12*); Tenasserim (Davison *7*); Cochin China (Tiraud *12*); Malay Peninsula (Hume *8*, Kelham *10*); Sumatra (Raffles *1*, Hagen *26*); Billiton (Brit. Mus. *33*); N. Borneo (Everett, etc. *22*); Palawan (Whitehead *19*, Platen *20*); Sangi Is. — Siao (Meyer *15*, *20*, Nat. Coll.); Celebes: — (Reinwardt *a 2*), Banka Id. and Lembeh Id. (Nat. Coll.), Minahassa (P.& F. Sarasin *32*), Gorontalo Distr. (Rosenberg *a 3*, *a 4*, *c 2*, Riedel *5*, *17*); Java (Vorderman *a 6*); Flores (Wallace *11*); Timor (S. Müller *11*); Timorlaut (H. O. Forbes *13*, *14*); Moluccas — Morty, Halmahera, Batchian (fide Salvadori *11*); Goram (Wallace *33*); Papuasia — Waigiou (Platen *16*), New Guinea, Mysore, Aru (fide Salvadori *11*); North & East Australia (Gould *2*, Ramsay *18*).

In the long list of Herons occurring in Celebes the present species is easily recognised by its great size, and by its general coloration of slate-grey, with ashy white hackle-feathers in the occipital crest, on the neck and jugulum and among the scapulars. Its nearest affinities are with *Ardea affinis* Hodgs. of the inland parts of N. India below the Himalayas, and N. Burmah; this form, as shown by Mr. Hume *(7)*, differs in having the under-parts white (not dark grey), and in other points. Davison found *Ardea sumatrana* about the sea-coast and the mouths of the large creeks and rivers in South Tenasserim; Kelham describes it as plentiful among the jheels and paddy-swamps of Perak; it seems not to wander far inland from the sea-coast, and in N. Celebes, judging from the number of specimens examined by us, it would seem to be more plentiful on the small islands off the coast than elsewhere. Its food was ascertained by Davison to be small fish, crabs, etc.

[1] Measured over the wing. When measured straight under the wing the length is about 30 mm less.

A. sumatrana was separated generically, as *Typhon*, by Reichenbach, but there is no prominent peculiarity, so far as we can see, by which it may be separated from the Common Heron, *A. cinerea*, the type of *Ardea*, to the young of which it bears much resemblance in coloration. Its tarsus is covered with hexagonal and pentagonal scales of irregular shape, and its middle toe is about three-quarters the length of the tarsus, wherein, amongst other points, it differs from the Purple Heron, *Phoyx*.

GENUS NOTOPHOYX Sharpe.

Herons of small-medium size, distinguishable from *Ardea* by the slender, unserrated bill, from *Herodias* by their coloured plumage, the absence of decomposed dorsal plumes, from *Demiegretta* by their crest, relatively longer tarsus, longer bare part of tibia ($^2/_3$ the length of the tarsus). and longer tail. The tarsus is transversely scaled anteriorly on the upper two-thirds, reticulated with small scales behind.

348. NOTOPHOYX PICATA (J.Gd.).

Pied Egret.

a. **Ardea (Herodias) picata** *(1)* Gld., P. Z. S. 1845, 62.

b. **Herodias picata** *(1)* Gld., B. Austr. 1848, VI, pl. 62; *(2)* id., Hb. B. Austr. 1865, II, 306; *(3)* Rams., Tab. List 1888, 21.

c. **Ardea picata** *(1)* Gray, Gen. B. App. 1849, 25; *(2)* Rchw., J. f. O. 1877, 262, 277; *(3)* Rosenb., Malay. Archip. 1878, 278; *(4)* id., Zool. Garten 1881, 167; *(5)* Salvad., Orn. Pap. 1882, III, 343; *(6)* W. Blas., J. f. O. 1883, 126; *(7)* Büttik., Notes Leyden Mus. 1886, 67; *(8)* Salvad., Orn. Pap. Agg. 1891, 205; *(9)* Büttik., Zool. Erg. Weber's Reise 1893, III, 283.

d. **Ardea aruensis** *(1)* Gray, P. Z. S. 1858, 188, 197; *(2)* Salvad., Orn. Pap. 1882, III, 344;

e. **Ardea lansbergi** *(1)* Schl., Notes Leyden Mus. 1879, 113; *(2)* Rchw. & Schal., J. f. O. 1879, 421; *(3)* W. Blas., ib. 1883, 124.

Notophoyx picata *(1)* Sharpe, Cat. B. 1898, XXVI, 112.

f. **Notophoyx aruensis** *(1)* Sharpe, Cat. B. 1898, XXVI, 113.

For synonymy and further references cf. Salvadori *c 5*, *d 2*; Büttikofer *c 7*, *c 9*.

Figure and descriptions. Gould *b 1*, *b 2*; Salvadori *c 5*; Schlegel *e 1*, *e 2* (= juv.); Sharpe *1*, *f 1*.

Adult. "Upper part of the head, occiput, occipital plumes, the whole of the plumage of the body, wings and tail bluish slaty black; chin, neck, chest and some of the lanceolate feathers dependent therefrom, white; some few of the lanceolate feathers on the neck and breast have one web white and the other web bluish slaty black; the remainder of these lanceolate feathers are the same colour as the body; irides yellow; bill, legs and feet greenish yellow; total length 430 mm; wing 254; bill 82.5; tail 89; tarsus 82.5" (Gould *b 2*).

Young. Browner, scarcely any ornamental plumes, head dusky; under surface streaked with white (Sharpe *1*).

Immature plumage. The immature (?) bird has the under parts white, the head and lower throat more ashy, the jugular feathers less lengthened.

Nest and eggs. Unknown.

Distribution. N. Australia (Gould *b I*, Ramsay *b 3*); New Guinea (D'Albertis *c 5*); Aru (Wallace *d 1*, *d 2*, Rosenb. *c 5*); Timorlaut (Riedel *c 7*); Amboina (fide Schlegel *c 5*); Celebes: — Southern Peninsula (Teijsmann *e 1*, *c 7*, Weber *c 9*), Northern Peninsula (Rosenb. *c 3*, *c 4*).

This rare Heron was discovered in Celebes first by von Rosenberg at Lake Limbotto in 1863—64, when he obtained a single example; subsequently five specimens were collected by Teijsmann in the Macassar District, and three (one adult and two young) by Prof. Weber in October, 1888, at Lake Tempe. Teijsmann's specimens, which were described by Schlegel as a distinct species, are held by Mr. Büttikofer on good grounds *(c 7, c 9)* to be the young of Gould's *Herodias picata*. Prof. Weber's acquisition of an adult specimen in the full plumage of *A. picata* seems to prove the correctness of this view.

Dr. Sharpe, who in his Catalogue of the Herons has overlooked Mr. Büttikofer's reference to Prof. Weber's specimens, as well as giving a somewhat confused synonymy, takes a different view; according to this ornithologist *Notophoyx picata* is one species, and the form with the under surface white a second species, *N. aruensis* (Gray); North Australia is indicated as the habitat of the former, and N. Australia to Aru and Celebes as that of *N. aruensis* (though, if the synonymy were correct, many localities would have to be added to the range of *N. picata*, and Celebes should be queried in that of *N. aruensis*). Dr. Sharpe has examined and described a young example of *N. picata*, and this is different from the white-bodied *N. aruensis*, while the two specimens of the latter in the British Museum do not appear to be immature; they are, therefore, held to be distinct. Seasonal and sexual (the female is undescribed) differences — if any — are not taken into consideration, nor, in our opinion, is sufficient room allowed for the supposition of immaturity, i. e birds in second plumage. If Sharpe's view be correct, then both species, *N. picata* and *aruensis*, belong to Celebes. Like Gould, Salvadori, and Büttikofer, we do not believe them to be two distinct species.

The Pied Egret is a well marked species, and its slaty black plumage with white throat, neck and gorget easily distinguishes it from other Herons. Nothing seems to have been recorded about its habits. In Australia it is only known from the North; here Gilbert discovered it among the swamps near Port Essington and found it in numbers on the islands in Van Diemen's Gulf. From its distribution it appears to be rather of Papuan than of Australian origin. Celebes marks its western bounds so far as is yet known.

349. NOTOPHOYX NOVAEHOLLANDIAE (Lath.).

White-fronted Heron.

a. **Ardea novae-hollandiae** *(1)* Lath., Ind. Orn. 1790, II, 701; *(II)* Gould, B. Austr. 1848, VI, pl. 53; *(3)* Pucher., Rev. Zool. 1851, 565; *(4)* Schl., Mus. P.-B., Ardeae, 1863,

28; *(5)* Gld., Hb. B. Austr. 1865, II, 299; *(6)* Pelz., Ibis 1873, 120; *(VII)* Buller, B. N. Zeal. 1873, 231, fig.; *(8)* Rchw., J. f. O. 1877, 263; *(9)* Rams., P. Z. S. 1877, 341; *(10)* Salvad., Orn. Pap. 1882, III, 342; *(11)* Meyer, Ztschr. ges. Orn. 1884, 196, 216; *(12)* Sclat., P. Z. S. 1887, 319; *(13)* Rams., Pr. L. Soc. N. S. W. 1887, 172; *(14)* Buller, B. N. Zeal. 2nd ed. 1888, II, 134; *(15)* Rams., Tab. List 1888, 21; *(16)* Pelz., Ann. Nat. Hofmus. Wien 1888, 54; *(17)* Cox & Hamil., Pr. L. Soc. N. S. W. 1889, 420; *(18)* North, t. c. 1025; *(19)* id., Nests & Eggs B. Austr. 1889, 318; *(20)* Tristr., Cat. Coll. B. 1889, 54; *(21)* Salvad., Agg. Orn. Pap. 1891, 205; *(22)* Hartert, Kat. Senckenb. Mus. 1891, 202; *(23)* Wiglesw., Av. Polyn. 1892, 67; *(24)* North, Pr. L. Soc. N. S. W. 1893, 238; *(25)* Büttik., Zool. Erg. Weber's Reise 1893, III, 306; *(26)* M. & Wg., Abh. Mus. Dresd. 1894, Nr. 4, p. 3; *(27)* iid., ib. 1895, Nr. 8, p. 18; *(28)* Hart., Nov. Zool. 1896, 565, 598.

b. **Herodias novae-hollandiae** *(1)* Gray, List Grallae Br. Mus. 1844, 80; *(2)* E. L. & L. C. Layard, Ibis 1882, 531, 544.

c. **Demiegretta novae-hollandiae** *(1)* Gray, HL. 1871, III, 28; *(2)* Meyer, Verh. z.-b. Ges. Wien 1881, 767.

Notophoyx novae hollandiae *(1)* Sharpe, Cat. B. 1898, XXVI, 109.

For further synonymy and references cf. Salvad. *a 10.*

Figures and descriptions. Gould *a II, a 5*; Buller *a VII, a 14*; Schlegel *a 4*; Salvadori *a 10*; Sharpe *1.*

Adult. General colour cinereous; forehead, face, chin and upper throat white; the rest of head above, ear-coverts, neck and upper surface dark cinereous, the occipital feathers lengthened (about 40—50 mm), the scapulars lengthened and narrow, wing-coverts washed with brown; remiges and tail-feathers slaty, the lateral tail-feathers browner; under parts, including lower fore-neck and elongated pectoral feathers, vinous grey; under wing-coverts paler, the longest and the axillaries whitish; bill blackish, base of under mandible yellowish; "iris whitish yellow; legs yellow" (P. & F. Sarasin); wing ca. 300—330 mm (tips of longest quills broken off in this specimen); tail 140; tarsus 96; mid. toe with claw 69; exposed culmen 84 (♀, Kema, 20. Oct. 1893: P. & F. Sarasin).

Male. According to Gould *(a II)*, it is a little larger than the female.

Young. "Differs from the adult in having more white about the head and neck, and a darker tinge of brown on the under parts; the dorsal plumes, moreover, are scanty, and the delicate purplish tint on the breast is altogether wanting" (Buller *a 14*).

Eggs. 4; uniform pale bluish green; size 50—53 × 34—35.5 mm (North *a 19*).

Nest. Of sticks and leaves in the topmost branch of a tree overhanging a river or dam (North *a 19*).

Breeding season. "Commences in September and continues during the three following months" (North *a 19*).

Distribution. Australia and Tasmania (Gould *a II*, Ramsay *a 15*, etc.); New Zealand (Buller *a 14*); Norfolk Id. (Metcalf *a 24*); New Caledonia (Layard, etc. *a 10, b 2, 1*); Loyalty Is. (Lay. *a 10*); Papuasia — ? New Guinea, Aru, Kei (fide Salvad. *a 10*); Timorlaut (Riedel *a 11*); Timor (S. Müller *a 4*, Wallace *a 10, 1*); Flores (Weber *a 25*); Sumbawa (Forsten *a 4*); Sumba (Riedel *c 2*); Lombok (Doherty and Everett *a 28*); ? Java *(a 10)*; Moluccas — Manawoka and ? Goram (Rosenb. *a 10*); North Celebes — Minahassa (P. & F. Sarasin).

The White-fronted Heron is a recent addition to the Celebesian avifauna, being one of the discoveries of the cousins Sarasin, who obtained the adult

female specimen described above at Kema in October, 1893. It is known from nearly all parts of Australia, where it breeds. The example from Celebes was killed during the breeding season in Australia, which is against the assumption that the bird is a migrant.

The best marks for distinguishing the present species from its fellow Herons in Celebes are its white forehead, face and upper throat, its dark grey upper surface with lanceolate scapulars, its yellow legs and blackish bill. The tarsus is encased in front with large transverse scales, taking a smaller reticulate form on the lower part. The toes are not long for a Heron (the middle one being three-quarters as long as the tarsus); the bill is thin and not serrated, and the general structure is light. According to Gould it runs more quickly than the other Herons and never stands motionless in the water; its food consists of crabs, fish and marine insects. It also, as Sir Walter Buller observed, snatches at flies and other insects which come within its reach. It seems to have no very close affinities with any other Heron. The unserrated and slender bill separates it from the true *Ardea* and discloses relationship with the White Herons, *Herodias;* in plumage, foot, etc. it shows more resemblance to *Demiegretta sacra*, from which it may be easily distinguished by the characters mentioned above, besides by its larger size and more slender bill.

GENUS DEMIEGRETTA Blyth.

The Reef Heron frequents the sea-shore, feeding upon molluscs, crabs, etc., and its toes and claws are stouter and shorter than in most of the fresh-water forms. The tarsus is somewhat short, about equal to the culmen, transversely scutellated in front, reticulated behind; the bill is not serrated, and the edges of the tomia do not quite meet in the terminal third. It occurs under two forms, one slaty, the other white; the differences between the latter and the white Herons of the genus *Herodias* are pointed out further on (key to the White Herons, p. 823).

350. DEMIEGRETTA SACRA (Gm.).

Reef Heron.

a. **Sacred Heron** *(1)* Lath., Gen. Syn. 1785, III, 92 (with var. A).

b. **New Guinea Heron** *(1)* Lath. op. cit. 71, Nr. 34.

c. **Blue Heron** var. B. *(1)* Lath. op. cit. 78.

d. **Ardea sacra** *(1)* Gm., S. N. 1788, I, 640; *(2)* Finsch & Hartl., Orn. Centralpol. 1867, 201; *(III)* Buller, B. New Zeal. 1873, 228, fig.; *(4)* Brügg., Abh. Ver. Bremen 1876, V, 97; *(5)* Rosenb., Malay. Archip. 1878, 278; *(6)* Legge, B. Ceylon 1880, 1137; *(7)* Ramsay, Pr. L. Soc. N. S. W. 1883, 42; *(8)* Seebohm, Ibis 1884, 176; *(IX)* Buller, B. New Zeal. 2nd ed. 1888, II, 129, pl. XXXVI; *(10)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 18.

e. **Ardea novae guineae** *(1)* Gm., S. N. 1788, I, 644; *(2)* S. Müll., Reizen Ind. Archip. 1858, II, 12.

f. **Ardea jugularis** [Forst. Icon. ined.]; *(1)* Wagl., Syst. Av., gen. Ardea 1827, sp. 18; *(2)* Forst., Descr. An. 1844, 172; *(3)* Schl., Mus. P.-B., Ardeae, 1863, 25; *(4)* Rchw., J. f. O. 1877, 261; *(5)* Rosenb., Zool. Garten 1881, 167; ? *(6)* Seeb., B. Japan 1890, 220; *(7)* Steere, List Coll. B. & M. Philipp. 1890, 26.

g. **Ardea aequinoctialis** *(1)* Forst. (nec L.), Descr. An. 1844, 156, 173.

h. **Herodias greyi** *(1)* Gray, List Grallae Br. Mus. 1844, 80; *(II)* Gould, B. Austr. 1848, VI, pl. 61.

i. **Herodias jugularis** *(1)* Gray, List Grallae Br. Mus. 1844, 80; *(II)* Gould, B. Austr. 1848, VI, pl. 60.

j. **Demiegretta jugularis** *(1)* Gould, Hb. B. Austr. 1865, II, 307; *(2)* Mathew, Pr. L. Soc. N. S. W. 1885, 255; *(3)* Walker, Ibis 1892, 257.

k. **Demiegretta greyi** *(1)* Gould, Hb. B. Austr. 1865, II, 309; *(2)* Mathew *j 2*; *(3)* Stejn., Pr. U. S. Nat. Mus. 1887, X, 302; *(4)* Walker, *j 3*.

Demiegretta sacra *(1)* Gray, HL. 1871, III, 28; *(2)* Wald., Tr. Z. S. 1872, VIII, 100; *(3)* Meyer, J. f. O. 1873, 405; *(4)* Hume, Str. F. 1874, II, 307; *(5)* Tweedd., P. Z. S. 1877, 55; *(6)* Hume & Dav., Str. F. 1878, VI, 481; *(7)* Meyer, Ibis 1879, 143; *(8)* Salvad., Orn. Pap. 1882, III, 345; *(9)* Oates, B. Brit. Burmah 1883, II, 250; *(10)* Meyer, Isis, Dresden 1884, 6, 56; *(11)* Guillem., P. Z. S. 1885, 561; *(12)* Büttik., Notes Leyden Mus. 1887, 80; *(13)* North, Pr. L. Soc. N. S. W. 1887, 445; *(14)* Rams., Tab. List 1888, 21; *(15)* W. Blas., Ornis 1888, 629; *(16)* North, Nests & Eggs B. Austr. 1889, 319, pl. XVIII, fig. 5; *(17)* Hickson, Nat. in N. Celebes 1889, 96; *(18)* Everett, J. Str. Br. R. A. S. 1889, 189; *(19)* Oates ed. Hume's Nests & Eggs 1890, III, 246; *(20)* Sharpe, Ibis 1890, 146, 285; *(21)* Salvad., Orn. Pap. Agg. 1891, 205; *(22)* id., Ann. Mus. Civ. Gen. 1891—92, (2) XII, 37, 142; *(23)* Wiglesw., Av. Polyn. 1892, 67; *(24)* Sharpe, Ibis 1894, 244, 258; *(25)* M. & Wg., J. f. O. 1894, 253; *(26)* Bns. & Worces., B. Menage Exped. 1894, 32; *(27)* Everett, Ibis 1895, 32; *(28)* Souëf, t. c. 422; *(29)* Bütt., Notes Leyd. Mus. 1896, 194; *(30)* Sharpe, Cat. B. 1898, XXVI, 137.

. ? **Demiegretta ringeri** *(1)* Stejn., Pr. U. S. Nat. Mus. 1887, X, 300.

"Swekko wung", "Swekko abu" and **"Swekko abu abu itam"**, Minahassa, Nat. Coll.

"Swekko puti" (puti = white), albino-form, Minahassa, iid.

"Bahoa maitung", Great Sangi, iid.

"Bahoa kadio", Siao, iid.

"Baleka mawora", Kabruang, Talaut, iid.

For further synonymy and references cf. Finsch & Hartlaub *d 2* (excl. *Ardea asha* Sykes, *Herodias pannosus* Gld.); Salvadori *8*, *21*; Wiglesworth *23* (Polyn.); Sharpe *30* (excl. *Garzetta eulophotes*).

Figures and descriptions. Gould *h II*, *i II*; Buller *d III*, *d IX*; Finsch & Hartl. *d 2*, Salvadori *8*; Oates *9*; Sharpe *30*; etc.

Adult. Slate-colour, tinged with brown; a broad streak on chin and upper throat, white; occipital feathers lengthened, feathers of back and scapulary region much lengthened and filamentous, those of jugulum lengthened and lanceolate; neck and under-parts browner than upper surface: soft parts "excessively variable" in colour (Hume *4*); "iris light yellow; bill dark brown; feet yellow-brown": Platen *15* (ad. Gt. Sangi, 31. VII. 93: Nat. Coll. — C 12668).

Immature. The immature bird is without the lengthened scapulary and jugular feathers.

Observation. The white throat-stripe is very variable in width, in some absent, in others about 10 mm broad.

Young. In young birds just able to fly "the general colour is somewhat duller and less dark. The whole under surface is paler and duller, the throat-streak [probably not always] is much broader, the elongated breast and back feathers are entirely wanting, and the crest is only indicated" (Hume *4*).

Observation. According to Oates *(9)*, in non-breeding plumage the pectoral tuft and the dorsal train are wanting. This is the case in many other Herons *(Herodias)*.

Sexes. The sexes do not seem to differ in size or coloration (Hume *4*).

Varieties. Pure white; the occipital, jugular and dorsal feathers lengthened as in the dark form; "iris primrose yellow; bill yellowish straw-colour, with a dusky tinge on the culmen and towards the point; . . . legs and feet yellowish green, soles orange": Gould *k 1* (Minahassa: Nat. Coll. — C 13261). Both sexes are known in this plumage.

Pure white young ones are known from the nest (Hume *4*, Buller *d IX*). Piebald specimens are not uncommon. One before us has the lower hind neck, back, middle and greater wing-coverts, spots at tips of remiges and rectrices, and some streaks on head and jugulum slaty or brown, the other parts white (Tahiti).

Measurements (Celebesian examples).	Wing	Tail	Tarsus	Mid. toe with claw	Exp. culmen
a. (C 12668) ad., Gt. Sangi, 31. VII. 93 (Nat. Coll.).	295	103	76	65	85
b. (C 12670) ad., Gt. Sangi, 12. VII. 93 (Nat. Coll.).	267	—	69	62	74
c. (C 12669) imm., Gt. Sangi, 22. VII. 93 (Nat. Coll.)	263	80	69	—	71
d. (C 13014) ad., Kabruang, 12. XI. 93 (Nat. Coll.).	278	90	72	66	81
e. (C 10950) ad., nr. Manado, Aug.—Sept. (Nat. Coll.)	280	97	74	63	81
f. (C 13260) imm., Minahassa, 22. I. 94 (Nat. Coll.).	277	95	85	70	83
g. (C 12096) imm., Banka, 13. V. 93 (Nat. Coll.) . .	270	90	75	60	76
h. (Sarasin Coll.) imm., ♂, Buol., Aug. 94 . . .	285	103	83	66	85
i. (C 13261) ad., (albino), Minahassa, 20. II. 94 (N. C.)	280	97	77	63	80

Moult. A specimen *(g)* killed in May is acquiring fresh primaries and wing-coverts, and one *(f)* killed in January is getting fresh wing-coverts and inner remiges.

Eggs. 2 or 3, moderately elongated ovals; shell rather coarse, much pitted with minute pores; entirely glossless; in colour uniform very pale sea-green; size 40.4—47 × 31.7—33.8 mm (from Hume *19*; see, also, North *16*, fig.).

Nest. Described as occupying various sites: in crevices of a rock, and on branches of a tree (Andamans — Davison *19*); in a tree, sometimes (when tall) near the summit, or on the root, or on a low stump, or half way up a low bushy tree, or in recesses of the rocks (islands off N. E. coast of Australia and Torres Str. — Macgillivray *j 1*, *16*); in caves (New Zealand — Buller *d IX*). The nest is composed of sticks and twigs, herbage being sometimes added.

Breeding season. Andamans — April to middle of June; Australia — September, November.

Distribution. Australia; New Zealand; Polynesia; Sandwich Islands; East India Archipelago; S. E. Asia up to Arrakan, Andaman and Nicobar Is.; Loochoo Is. and Japan (*D. ringeri* Stejn.). In the Celebesian area: — Talaut Islands — Kabruang (Nat. Coll.); Sangi Islands — Great Sangi (Meyer *10*, Platen *15*, Nat. Coll.), Siao (Meyer *10*); Talissi Id. (Hickson *17*); Banka Id. (Nat. Coll.); Minahassa (Meyer *7*, Guillemard *11*, etc.); Gorontalo Distr. (v. Rosenb. *d 5*, *f 5*); Buol (P. & F. Sarasin); Buton Id. (S. Müller *e 2*).

The Reef Heron occurs under two forms, one slate-colour, the other white. By some authors these are believed to be two distinct species, by others they are held to be of one species which is dichomatic. Slate-coloured adults and white adults of both sexes are known; also slate-coloured young and white young. Piebald intermediate examples are often observed; and slate-coloured and pure white birds are frequently seen paired. In habits the birds are similar, and they live together; but Hume and Davison in the Andaman and Nicobar Islands found that the white bird was (the rule with albinos?) much the shyer and more difficult to shoot of the two. The white form is much less plentiful than the dark, but it seems to occur everywhere with it, even in New Zealand *(d IX)*, where it has been supposed to be absent. The view that there is only one species with strong tendencies to albinism is the more probable one; in the allied species *Ardea gularis* of Africa, India and Ceylon, *A. coerulea* and *A. rufa* of America closely similar conditions occur, as pointed out by Finsch & Hartlaub, Stejneger, Legge, and Baird, Brewer and Ridgway. Such questions must be studied in the haunts of the birds; from the museum they cannot be answered.

Another matter which is likely to cause perplexity is the supposed existence of local races. The Reef Heron is known to breed in many localities (Australia, Tasmania, New Zealand, Fiji, Andamans, Arrakan), and it may perhaps be stationary in some localities; it is, however, according to Mr. Whitehead *(20)*, a migrant in North Borneo, which means, of course, that it moves in some other spots. The Arrakan and Nicobar birds were separated by Blyth as *Demiegretta concolor*, but on grounds subsequently shown by Hume to be invalid; more recently Stejneger named those inhabiting the Loochoo Islands and Corean Strait *D. ringeri*. Without material from all parts it is difficult to form an opinion on this question, towards solving which vol. XXVI of the Catalogue of Birds should go far, and in that work Sharpe does not admit *D. ringeri* as a species.

The Reef Heron seems to have its closest affinities with the Indo-African *A. gularis* (Bosc) in which the white of the throat extends over the submalar region and much farther down the throat, and, as Legge points out, it is longer in the leg and has much more of the tibia bare of feathers. The albino-form of *D. sacra* is likely to be mistaken at first sight for a white Heron of the genus *Herodias*; it may best be distinguished by its short tarsus, except from *H. eulophotes* in which, however, the first primary is the longest and the wing is shorter than in *sacra*. The bill of *Demiegretta* is peculiar; it is unserrated, stouter than in *Herodias*, not tapering to a sharp point, but of fairly even width for $^3/_4$ of its length, the cutting edges meeting at the tip, but not quite meeting for the terminal third behind it — a condition also seen in *Anastomus* and *Esacus magnirostris*, for instance, and a result, perhaps, of laying hold of rough objects, such as crabs, coarse-shelled molluscs, etc., on the sea-shore which the birds haunt. The toes of *Demiegretta* are stout, being covered with unusually thick transverse scales.

The differences between *Demiegretta* and *Herodias* are, however, so far as is known small, and the very large percentage of albinos in the present species (Hume says — "I cannot recall ever seeing three or four ash-coloured Herons without seeing a white one somewhere near them" — in the Andamans) seems to rank them as intermediate between the white and some of the grey Herons. Probably enough (though it may be long ere mankind sees the proof of it) *Demiegretta sacra* will end by becoming a white Heron, at least in some localities, as Dr. Stejneger suggests *(k 3)*.

The Reef Heron seems to be pre-eminently a bird of the sea-shore, and Gould found that it feeds on crabs and shelled molluscs.

GENUS HERODIAS Boie.

The Herons or Egrets of this genus are generally easily distinguishable from the other Herons by their entirely white plumage, and when in breeding dress by the dorsal train of decomposed feathers, while other ornamental plumes are usually present on the jugulum or crest according to the species. The tomia are smooth or very little serrated; the tarsus transversely scaled in front, except near the foot. In Celebes the only Herons which could be mistaken for them are *Bubulcus* and the albinos of *Demiegretta*, the differences of which are shown in the following key.

Key to the White Herons of Celebes.

a. Exposed culmen above 65 mm; hind toe and claw shorter than inner toe without claw.
  a'. Size large, wing 330—400 mm . . . . . *Herodias alba.*
  b'. Size smaller, wing not exceeding 320 mm.
    b''. Tarsus long, 95—120 mm.
      b'''. Toes very long, mid. toe and claw about 90 mm, exceeding length of bill; bill slightly serrated towards tip, in winter yellow; no occipital crest . . . . . *H. intermedia.*
      c'''. Toes shorter, mid. toe and claw about 70 mm, not so long as the bill; bill not serrated, in winter black, almost as in breeding season; an occipital crest of two long feathers when in breeding plumage: *H. garzetta.*
    c''. Tarsus short, 70—85 mm.
      d'''. Size smaller, wing 230—260 mm; first primary as long or longer than second and third; bill, legs and toes slenderer, breadth of claw of middle toe 2 mm; in breeding season with a crest and jugular tuft of numerous lanceolate feathers, and long dorsal train of decomposed plumes: *H. eulophotes.*
      e'''. Size larger, wing 260—300 mm, first primary about 5 mm shorter than second and third; bill, legs and toes stout, breadth of claw of middle toe 3 mm, lengthened dorsal feathers lanceolate, not decomposed: *Demiegretta sacra (albino).*
b. Exposed culmen under 65 mm; hind toe and claw equal to inner toe without claw: *Bubulcus coromandus.*

351. HERODIAS EULOPHOTES Swinh.

Short-legged White Egret.

Plate XLIV.

a. ? **Herodias immaculata** *(1)* Gld., B. Austr. VI pl. 58 (1848); *(2)* Blyth, Ibis 1865, 37; *(3)* Stejn., Pr. U. S. Nat. Mus. 1887, X, 317; *(4)* M. & Wg., Abh. Mus. Dresd. 1894. Nr. 4, p. 3; *(5)* iid., ib. 1895, Nr. 8, p. 19.

b. ? **Ardea immaculata** *(1)* Gray, Gen. B. III, 555 (1847).

c. ? **Herodias melanopus** (nec Wagl.); *(1)* Blyth, J. A. S. B. 1853, XXII, 437; *(2)* id., Ibis 1865, 37; *(3)* Gould, Hb. B. Austr. 1865, II, 304; *(4)* Rams., Tab. List 1888, 21.

d. ? **Garzetta immaculata** *(1)* Bp., Compt. Rend. 1855, XL, 722; *(2)* id., Consp. 1855, II, 119.
Herodias eulophotes *(1)* Swinh., Ibis 1860, 64; *(2)* id., ib. 1863, 418, 425; *(3)* id., P. Z. S. 1863, 320; *(4)* id., ib. 1871, 412; *(5)* David & Oust., Ois. Chine 1877, 441; *(6)* Hume, Str. F. 1878, VI, 478, 480; *(7)* id., ib. 1879, VIII, 114; *(8)* Oates, B. Brit. Burmah 1883, II, 249; *(9)* Stejn., Pr. U. S. Nat. Mus. 1887, X, 318; *(10)* Ridgw., Sm. Rep. 1889, 358; *(11)* De la Touche, Ibis 1892, 409, 488; *(12)* Sclat. t. c. 577.

e. **Ardea eulophotes** *(1)* Schl., Mus. P.-B., Ardeae, 1863, 29; *(2)* Rchw., J. f. O. 1877, 274; *(3)* Seeb., B. Japan 1890, 219.

f. **Ardea nivea** pt. *(1)* Rchw., J. f. O. 1877, 271.

g. **Ardea melanopus** *(1)* Dress. (nec Wagl.), B. Europe VI, 243 (1880).

h. **Garzetta nigripes** pt. *(1)* Sharpe, Cat. B. 1898, XXVI, 122 (in synon.).

i. **Demiegretta sacra** pt. *(1)* Sharpe, Cat. B. 1898, XXVI, 139 (in synon.).

Figure and descriptions. Gould (?) *a I, c 3*; Blyth *a 2*; Swinhoe *1, 2*; Hume *6*; Oates *8*.

Breeding plumage. Entirely white; an occipital crest of about twenty very narrow (but not decomposed) feathers, the longest about 100 mm long; jugulum with similar lanceolate plumes; a dorsal train of lengthy decomposed feathers; bill yellow; cere tinged with green and purple, irides light pearly yellow; legs black; feet, and claws greenish yellow: Swinh. *2* (Mantehage Id., N. Celebes, 26. April, 1893: Nat. Coll. — C 12092).

Winter plumage. Without the ornamental crest and jugular feathers and dorsal train; bill dark brown, shading off into yellowish on the basal third of upper bill and on the basal two-thirds of lower bill; legs greenish brown: Swinhoe *3* (♀ — ? immature, Kema, 7. October 1893: P. & F. Sarasin).

Measurements.	Wing	Tail	Tarsus	Mid. toe and claw	Exp. culmen
a. (C 12092) ad., Mantehage Id., 26. IV. 93 (Nat. Coll.)	257	85	84	63	79
b. (Sarasin Coll.) ♀, Kema, 7. X. 93	242	84	82	60	76
c. Amoy (Swinhoe *1*)	235	—	76	63	—
d. ♀, Tenasserim (Hume *6*)	240	—	78	69	75

According to Swinhoe *(2)* the female is a little larger than the male.

Nest. Swinhoe *(2)* saw this Egret in North Formosa apparently breeding in the same heronries with *H. garzetta*, but he did not succeed in taking its eggs, which are as yet unknown.

Distribution. Japan[1]) (Jouy *10, 12*); Formosa (Swinhoe *2, 4*); South China (Swinhoe *1, 4*, De La Touche *11*); Tenasserim (Berdmore & Davison *6*); Andamans (Hume *6*);

[1]) Or Corea: — the exact locality is not stated.

Celebes: — Mantehage Id. (Nat. Coll.), Minahassa — Kema (P. & F. Sarasin *a 4*, *a 5*); South coast of New Guinea (fide E. P. Ramsay *c 4*); Australia (Gould *a I*, *c 3*, Ramsay *c 4*).

This rare Egret was first discovered in Celebes in 1893, when our native hunters got an example in breeding plumage in April on the island of Mantehage off the coast of the Minahassa, and the Drs. P. & F. Sarasin a second in October on the mainland at Kema, the latter being in winter or immature dress without any decorative plumes and with a partially black bill. Unless we are much mistaken, it is in this partial winter plumage that Gould has figured the species in his "Birds of Australia" as *H. immaculata*. Here Gilbert says that he met with it in great numbers in Van Diemen's Gulf, N. Australia. There seem to be only two records of its occurrence in Tenasserim and only one from the Andamans, as shown by Hume and Oates. In North Formosa Swinhoe found it pretty common, "being frequently seen in parties of four and five and in company with the *H. garzetta*", with which they seemed to be nesting. "This and *H. garzetta* feed almost entirely on fish, shrimps, and *Squillae*; whereas the Yellow-head *(Buphus coromandus)* and all the *Ardetta* group are to a great extent omnivorous. I have kept alive most of the *Ardeidae* that occur in China". Swinhoe makes some instructive remarks on the seasonal changes this species undergoes, the bill being of a fine clear yellow in summer, becoming tinged with brown in winter; the legs are in summer black, in winter greenish brown; the crest is shed in August, when the other nuptial plumes are much worn. Mr. De La Touche says that "at Swatow (in South China) it is very abundant during the summer, but goes south for the winter". We suspect that it is only a winter visitor to Celebes, but there is, of course, as yet no sufficient evidence whereon to ground an opinion.

In winter plumage, when much of its bill is blackish, this Egret is very liable to be mistaken for *H. garzetta*; it may best be distinguished by its short legs (the tarsus being considerably less than 90 mm, while in *H. garzetta* it is about 100 mm); also its bill is shorter and probably never black on the basal half of the upper, as well as the under, mandible, and the first primary is as long or longer than the second and third, whereas in *garzetta* it is slightly shorter (2—5 mm). In breeding dress it is easily recognisable by its crest of many lanceolate feathers and yellow bill. *Demiegretta sacra* has similar short, though much thicker, legs, toes and claws; in the albino state this bird may further be distinguished from *H. eulophotes* by its longer wing (with the first primary about 5 mm shorter than the third) and by its stout bill.

There is little reason to doubt that Swinhoe's *H. eulophotes* and Gould's *H. immaculata* are one and the same species, as Blyth *(c 2)* long ago stated them to be. What the *Herodias immaculata* of Salvadori (Orn. Pap. 1882, III, 356) from New Guinea is we do not know; it is a large bird with the tarsus 110 mm long, or 25—35 mm longer than in the subject of the present article,

and its crest is formed of numerous decomposed feathers, as in the American *H. candidissima*. Gould unfortunately does not give the measurements of his *H. immaculata*, neither does he state the character of the crest, but he says that his plate represents the bird of the size of life, — that is with the tarsus 82 mm long, as in Swinhoe's *eulophotes*. Salvadori's bird is also much longer in the wing. Can it have been a straggler from America of *H. candidissima*? Sharpe unites *H. immaculata* with the eastern form of the Black-billed Egret, *H. nigripes*, including both what Salvadori calls *immaculata* and what we call *immaculata (a 4)* under that species, and making Swinhoe's *eulophotes* a synonym of *Demiegretta sacra*!

352. HERODIAS GARZETTA (L.).

Black-billed White Egret.

a. **Ardea garzetta** *(1)* Linn., S. N. 1766, I, 237; *(II)* Naum., Vög. Deutschl. 1838, IX, 101, t. 223; *(3)* Schl., Mus. P.-B., Ardeae, 1863, 12; *(4)* Finsch & Conrad, Verh. z.-b. Ges. Wien 1873, 3 (sep. c.); *(5)* Ros., Malay. Archip. 1878, 278; *(VI)* Dresser, B. Eur. 1880, VI, 239, pl. 399; *(7)* Rosenb. Zool. Garten 1881, 167; *(8)* Joest, Holontalo 1883, 106; *(9)* Seeb., B. Japan 1890, 218; *(10)* Steere, List Coll. B. & M. Philipp. 1890, 26.

b. **Ardea nigripes** *(1)* Temm., Man. d'Orn. 2nd ed. 1840, III, 377; *(2)* Schl., Mus. P.-B., Ardeae, 1863, 14.

Herodias garzetta *(1)* Gray, List Grallae Br. Mus. 1844, 78; *(2)* Gould, Hb. B. Austr. 1865, II, 305; *(3)* David & Oust., Ois. Chine 1877, 440; *(4)* Hume, Str. F. 1878, VI, 476, 480; *(5)* Oust., Bull. Soc. Philom. 1878, 187; *(6)* Legge, B. Ceylon 1880, 1144; *(7)* Tweedd., Orn. Works 1881, 399, 528, 601, 625, 660; *(8)* Salvad., Orn. Pap. 1882, III, 354; *(9)* Kelh., Ibis 1882, 193; *(10)* Oates, B. Brit. Burmah 1883, II, 248; *(11)* Vorderm., N. T. Ned. Ind. 1885, XLIV, 235; *(12)* Stejn., Pr. U. S. Nat. Mus. 1887, X, 316; *(13)* E. P. Rams., Tab. List 1888, 21; *(14)* Hartert, J. f. O. 1889, 406; *(15)* Oates, ed. Hume's Nests and Eggs 1890, III, 242; *(16)* Salvad., Orn. Pap. Agg. 1891, 206; *(17)* Styan, Ibis 1891, 327, 492; *(18)* De La Touche, Ibis 1892, 488; *(19)* Styan, Ibis 1893, 434; *(20)* M. & Wg., J. f. O. 1894, 252; *(21)* Bns. & Worces., B. Menage Exped. 1894, 31.

c. **Garzetta egretta** (Br.), **orientalis** (J. E. Gr.), and **nigripes** (Temm.); *(1)* Bp., Consp. II, 1855, 118, 119.

d. **Herodias nigripes** *(1)* Wald., Tr. Z. S. 1872, VIII, 99; *(2)* Salvad., Cat. Ucc. Borneo 1874, 349; *(3)* Meyer, Ibis 1879, 143, 146; *(3bis)* Nicholson, Ibis 1882, 70; *(4)* W. Blas., J. f. O. 1882, 253; *(5)* id., ib. 1884, 219; *(6)* id., Ztschr. ges. Orn. 1885, 316; *(7)* id., Ornis 1888, 630; *(8)* Everett, J. Str. Br. R. A. S. 1889, 189.

e. **Garzetta egretta** *(1)* Swinh., P. Z. S. 1871, 412.

f. **Ardea garzetta** var. **nigripes** *(1)* Brügg., Abh. Ver. Bremen 1876, V, 96.

g. **Egretta garzetta** *(1)* Blak. & Pryer, Ibis 1878, 224.

h. **Herodias immaculata** *(1)* Meyer (nec Gld.), Isis, Dresden 1884, 56; *(2)* Salvad., Agg. Orn. Pap. 1891, 206.

i. **Herodias garzetta nigripes** *(1)* Stejn., Pr. U. S. Nat. Mus. 1887, X, 317.

j. **Herodias melanopus** "Wagl."; *(1)* Rams., Pr. L. Soc. N. S. W. 1887, 172.

k. **Garzetta garzetta** *(1)* Sharpe, Cat. B. 1898, XXVI, 118.

l. **Garzetta nigripes** *(1)* Sharpe, op. cit. 122 (syn. emend.).

"Tomeo", Gorontalo, Joest *a 8.*

"Condor putih", Tjamba and Maros, Platen *d 6.*

"Baroa adioa" [also the name of *Bubulcus coromandus*], Kabruang, Talaut, Nat. Coll.

"Bahoa mawira", Great Sangi, Nat. Coll.

For further synonymy and references cf. Salvadori *8* (excluding *Ardea nigrirostris* J. E. Gray); Stejneger *i 1.*

Figures and descriptions. Naumann *a II*; Dresser *a VI*; Hume *4*; Legge *6*; Salvadori *8*; Oates *10*; Vorderman *11*; Sharpe *k 1*, *l 1*; etc., etc.

Breeding plumage. Entirely white; the feathers of the back greatly lengthened, overreaching the tail by about 25 mm, the webs decomposed into long thread-like rami, the shafts curving upwards at the distal ends; an occipital crest of two lanceolate feathers about 120 mm long; feathers of jugulum lanceolate, very narrow, about 100 mm long; "iris light yellow; feet [and legs] black; bill black": Platen *d 6* (ad., Minahassa: Faber — Nr. 3549).

According to Legge the bill in summer is entirely black. The specimen described has a little yellowish at the base of the lower bill, as in that of Prof. W. Blasius *(d 6)*, but noticeably less than in our other Celebesian specimens, which are not in breeding plumage, or only partly so. Prof. W. Blasius *(d 7)* regards the perfectly black bill as a character of the male.

Winter plumage. The elongated jugular feathers and the occipital lanceolate pair wanting; the dorsal train wanting, or only the worn remains of it present; basal half of lower bill yellowish (Lake Tondano, Aug.—Sept. 1892: Nat. Coll. — C 10969).

Immature. Like the adult in winter; bill smaller (Kabruang, 5. XI. 93: Nat. Coll. — C 13011).

Nestling. Covered with white down (Legge *6*).

Measurements (Celebesian examples).	Wing	Tail	Tarsus	Mid. toe with claw	Exposed culm.
a. (C 3549) ad., Minahassa, N. Peninsula (Faber) . .	265	93	106	72	91
b. (C 10969) ad., L. Tondano, N. Pen., VIII.—IX. 92 (N.C.)	268	100	98	74	92
c. (C 10966) ad., Lake Tond., N. Pen., VIII.—IX. 92 (N.C.)	258	87	105	66	89
d. (C 10967) ad., Lake Tond., N. Pen., VIII.—IX. 92 (N.C.)	272	98	102	69	91
e. (C 10968) ad., Lake Tond., N. Pen., VIII.—IX. 92 (N.C.)	266	90	104	72	88
f. (C 12672) ad., Great Sangi, July 93 (Nat. Coll.) .	266	97	100	69	83
g. (C 12671) ad., Great Sangi, July 93 (Nat. Coll.) .	242	82	98	66	88
h. (C 13011) viz. ad., Kabruang, Talaut, Nov. 93 (N. C.)	262	96	102	70	82

Eggs. 3 or 4; moderately smooth in texture; pale sea-green; some rather pointed at both ends; size 40.6—47 × 31.7—35 mm (Legge *6*, Hume *15*).

Nest. Of sticks, in the branches of trees growing in swampy country.

Distribution. The southern countries of Europe, a rare straggler in the northern and central portions, but ranging far south in Africa, found right across Asia [not including Siberia], down to the East India Archipelago and Australia (Dresser *a VI*). — For exact localities in the Indo-Australian area cf. Salvadori *8*, *16*; adding some Philippine Islands (Steere *a 10*, Bourns & Worcester *21*), Singapore (Kelham *9*), Talaut and Sangi Is. (Nat. Coll.), Burmah (Oates *10*), Tenasserim (Dav. *4*), Ceram (Riedel *h 1*), Keeling Is. (H. O. Forbes *d 3bis*). — In the Celebesian area: Minahassa (Meyer *d 3*, Faber, Nat. Coll.), Gorontalo Distr. (Forsten *a 3*, v. Rosenberg *a 7*, *f 1*, etc.), Togian (Meyer *d 3*), Tjamba and Maros (Platen *d 6*); Great Sangi (Platen *d 7*, Nat. Coll.); Talaut Is. — Kabruang (Nat. Coll. *20*).

The Black-billed Egret has not yet been recorded as breeding in Celebes, but it occurs there in summer as well as in winter, and we have it in almost perfect breeding plumage. In China it is a partial migrant, but its movements seem to be of a somewhat local character; in South Japan it is, according to Seebohm, a resident. In some portions of India it is described as a resident, in others it is not stationary. From Dresser's investigations it appears to be a summer visitor to most of the places in South Europe where it is found, but it is known to winter in Albania and Epirus; in Northern Africa it is generally a resident, though only a spring and autumn bird of passage in some parts. According to Schlegel *(a 3)* this Egret is a trifle smaller in tropical Asia than in Europe, the toes and claws are blackish and the base of the bill often yellowish. The last is a sign of non-breeding; as to size it appears from the measurements of Dresser compared with those given above that the tarsus is on an average slightly shorter in the East than in the West. The birds of Java, Borneo and Celebes received the name *Ardea nigripes* from Temminck.

Dr. Sharpe *(l 1)* admits *H. nigripes* as a good species, drawing the line of geographical separation between it and *H. garzetta* at Celebes and Java as the furthest bounds of the former species, and the Philippines, Borneo and Sumatra as the furthest of *H. garzetta*. Without denying that the bird tends to get blacker feet in the direction of Australia, we are unable to follow Dr. Sharpe in drawing this clear line of geographical demarkation and think it better to treat of all individuals as belonging to one species. But if two "species" be made of them, the geographical dividing line may certainly be as well fixed where Dr. Sharpe has drawn it, as anywhere else.

In America this Egret is represented by *H. candidissima* (Gm.), in which the two crest-feathers of *H. garzetta* are replaced by a number of long decomposed fibrous feathers, and the lanceolate jugular feathers are similarly replaced by decomposed ones. For this reason Dr. Sharpe (Ibis 1894, 432) separates the American bird generically *(Leucophoyx)*; and again he allows *H. garzetta* to stand as a genus *Garzetta* distinct from *Herodias* on account of its longer and slenderer bill, which exceeds the length of the middle toe and claw. Few ornithologists will admit that a slight modification of some of the decorative feathers of a Heron (which are cast off after the breeding season) should warrant its exclusion from the old genus, and we cannot cease to regard the American Little Egret as a brother — in truth a little more highly differentiated — of the Old World form. As to *Herodias* it would appear from Dr. Sharpe's remarks that its bill does not exceed the middle toe and claw in length, but just the opposite is the case in all specimens of *Herodias alba* (with its Eastern form *torra*) which we have examined. We fail to see what end is served by concealing the affinities of allied forms, such as these white Egrets prove to be, under separate generic appellations; at the most the name *Garzetta* should be employed for *H. garzetta* as a subgeneric term not for common use, its differences

from *Herodias alba* being the possession (when in breeding plumage) of an occipital crest and of ornamental jugular feathers, and a less conical bill, which is chiefly black, not yellow, in winter.

Of the other Egrets occurring in Celebes *H. intermedia* may be at once separated from *garzetta* by its yellow bill and much longer toes (90 mm as against about 70 in *garzetta*). *H. eulophotes* Swinh. (*H. immaculata* Gld.) has a much shorter tarsus than *garzetta* (80 against 100 mm), shorter toes (63 against ca. 70 mm), shorter bill, its first primary as long or longer, not shorter, than the third, and in the breeding season a yellow bill and a crest of many (not simply two) occipital lanceolate feathers. *Bubulcus coromandus* in pure white plumage may always be recognised by its short bill.

353. HERODIAS ALBA (L.).

Great White Egret.

The Great White Egret is almost cosmopolitan in its range, but, like most species with a wide distribution, it presents some geographical differences. In Indo-China and Australia it is small in size, and it is to these individuals that the following synonymy belongs:

a. **Ardea torra** "Buchanan" *(1)* Frankl., P. Z. S. 1831, 124.

b. **Ardea modesta** *(1)* J. E. Gray, Zool. Misc. 19 (1831); *(II)* id. & Hardw., Ill. Ind. Zool. 1834, II, pl. 49, fig. 1.

c. **? Ardea timoriensis** [Cuv., Paris Mus.]; *(1)* Less., Tr. d'Orn. 1831, 575.

d. **Herodias syrmatophorus** *(1)* Gould. B. Austr. 1848, VI, pl. 56.

e. **Ardea egretta** *(1)* Schl., Mus. P.-B., Ardeae, 1863, 17; *(2)* Rosenb., Malay. Archip. 1878, 278; *(3)* id., Zool. Garten 1881, 167.

Herodias alba (Linn.); *(1)* Jerd., B. Ind. 1864, III, 744; *(2)* Gould, B. Australia 1865, II, 301; *(3)* David & Oust., Ois. Chine 1877, 439; *(4)* Legge, B. Ceylon 1880, 1138; *(5)* Oates, B. Brit. Burmah 1883, II, 246; *(6)* Rams., Pr. L. Soc. N. S. W. 1887, 172; *(7)* id., Tab. List. 1888, 21; *(8)* Cox & Hamil., Pr. L. Soc. N. S. W. 1889, 421; *(9)* North, Nests and Eggs B. Austr. 1889, 398; *(10)* Seeb., B. Japan. 1890, 216; *(11)* Oates ed. Hume's Nests and Eggs 1890, III, 237; *(12)* Styan, Ibis 1891, 327, 491; *(13)* De La Touche, Ibis 1892, 488.

f. **Egretta modesta** *(1)* Swinh., P. Z. S. 1871, 412.

g. **Herodias egretta** *(1)* Wald., Tr. Z. S. 1872, VIII, 99.

h. **Herodias torra** *(1)* Salvad., Cat. Ucc. Borneo 1874, 347; *(2)* Hume, Str. F. 1878, VI, 472; *(3)* Salvad., Orn. Pap. 1882, III, 350; *(4)* Everett, J. Str. Br. R. A. S. 1889, 189; *(5)* Sharpe, Ibis 1890, 146, 285; *(6)* Salvad., Agg. Orn. Pap. 1891, 206; *(7)* M. & Wg., J. f. O. 1894, 252.

i. **Ardea alba** var. **modesta** *(1)* Brügg., Abh. Ver. Bremen 1876, V, 96.

j. **Herodias alba modesta** *(1)* Stejn., Pr. U. S. Nat. Mus. 1887, X, 314.

k. **Egretta alba modesta** *(1)* Tacz., Faun. Orn. Sib. Orient. 1893, II, 979.

l. **Ardea alba modesta** *(1)* Seeb., Ibis 1893, 52.

m. **Herodias timoriensis** *(1)* Sharpe, Cat. B. 1898, XXVI, 98.

"Swekko puti besar" (puti besar = white large), Malay, Tondano, Nat. Coll.

"Pokok kulo sela", Tondano, iid.

"Baletagi bahejwa", Kabruang, Talaut, iid.

For further synonymy and references cf. Salvadori *h 3*; Stejneger *j 1*.

Figures and descriptions. J. E. Gray & Hardwicke *b II*; Gould *d I, 2*; Hume *h 2*; Legge *4*; Salvadori *h 3*; Oates *5*; Taczanowski *k 1*; Sharpe *m 1*.

Description. Entire plumage white; no ornamental plumes on the nape and jugulum; "iris yellow; bare skin round the eye and of lores greenish" (Taczan.) *k 1*; tarsi and feet black.

Breeding plumage. Bill black; a long dorsal train extending about 100 mm beyond the tail consisting of lengthened feathers, decomposed into shafts with long thread-like rami, which spring from the upper back and scapulary region; bare part of tibia reddish brown.

Winter plumage. Bill yellow; tibia black, like the tarsus; the dorsal train wanting.

Young. Bill yellow, and the dorsal train wanting, as in the adult in winter; wing and bill apparently smaller.

Nestling. "Covered with white down, the legs brownish" (Legge *4*).

Measurements.	Wing	Tail	Tarsus	Middle toe with claw	Exposed culm.
a. (C 2004) imm.? Lake Tondano, June, 71 (Meyer)	350	135	146	101	108
b. (C 10971) ad., L. Tond., Aug.—Sept. 92 (Nat. C.)	370	136	168	109	115
c. (C 10970) imm.? L. Tond., Aug.—Sept. 92 (N. C.)	340	120	137	95	106
d. (C 13010) ad., Kabruang, 9. Nov. 93 (Nat. Coll.)	372	150	155	108	112
e. (C 13009) imm.? Kabruang, 7. Nov. 93 (Nat. C.)	354	132	150	103	107
Typical Ardea alba (for comparison).					
(Nr. 13931) ♂, ad., Astrachan (Henke)	455	185	190	115	123

Observation. All the five Celebesian specimens have yellow bills, and those marked adult are still wearing the lengthened filamentous dorsal plumes of the breeding season, or some of them. Comparing the bill with the wing the eastern Great White Heron seems to have a longer bill than the *typical alba*.

Moult. Specimen *d* killed in November is acquiring fresh ornamental dorsal feathers.

Eggs. Three or four in number, moderately smooth in texture, nearly regular ovals in shape, of an uniform pale greenish blue colour; size 51.8—55.9 × 35.3—38.9 mm (Legge *4*).

Nest. Of sticks, on the topmost branches of trees, the surface of the nest very flat with scarcely any hollow[1]) for the eggs, which rest upon a lining of roots and twigs (Legge *4*).

Distribution in the East. Corea, Japan and China west to India and Ceylon, the East Indies to Australia and Tasmania. — In the Celebesian area: Minahassa (Meyer, Nat. Coll.), Gorontalo Distr. (Forsten *e 1*, Rosenb. *e 3*, *i 1*), Talaut Is. — Kabruang (Nat. Coll.); Sula Islands (Wallace *m 1*). For exact localities cf. Salvadori *h 3*, *h 6*, adding Corea (Kalinowski *k 1*), Loochoo Is. (Stimpson *j 1*, Holst *l 1*), Talaut Is. (Nat. Coll. *h 7*), and excluding (?) New Zealand (Buller).

The Large White Egret is perhaps not stationary in Celebes, where few specimens have been recorded. One without any dorsal train was obtained in

[1]) A rounded bottom to the nest would probably result in the long-legged young, which squat upon the tarsi, getting crooked shanks; presumably a hollow would be very inconvenient also to the legs of the brooding female. The amusing fallacy that the sitting Heron, as also the Flamingo, sat astraddle on the nest like a man on horseback, may here be mentioned.

July, 1844, by Forsten at Gorontalo, one by Rosenberg at the same place in August, 1863 (the one in the British Museum), another by the same collector is mentioned by Brüggemann, one was obtained in June, 1871, by Meyer at Kakas, Lake Tondano, two in August or September, 1892, by our native collectors at the same lake; and they also procured it from Talaut in November. It appears likely that these birds are migrants from East Asia, though some immature individuals, if not also adults, certainly stay all the summer at the large lakes of the island.

As to its wandering, Kalinowski says that it is common in Corea in summer and leaves that country for the winter. David states that it occurs in the northern provinces of China in summer and breeds there, but it is present in the southern provinces all the year. Styan makes observations on a remarkable transit which takes place in spring and autumn in the Lower Yangtse district, where a few remain to breed, and in South China (Foochow) De La Touche describes it as only a spring and autumn bird of passage. It is probable that this migration is carried on down to the East Indies, as is the case with so many other species.

In the opinion of most ornithologists *Herodias torra* Buchanan, as Salvadori calls it, or *timoriensis* according to Sharpe's nomenclature, is only a race of *H. alba*, the Great White Egret of Europe, Western Asia and N. Africa, differing only by its small size. It seems very probable that interbreeding and a complete intergradation in size between adults of the two forms may occur in Asia; satisfactory proof of this is wanting. Large birds are found in India and at times in Japan, but they may be visitors of the western race. Broadly viewed the Great White Egret is almost cosmopolitan in its range; in the West *(H. alba)* it is largest in size; in South Africa, as in East Asia and the East India Islands and Australia *(H. torra* or *timoriensis)* it is smallest; in New Zealand (another race) it is large again and the bill seems to be yellow all the year round, though Sir Walter Buller knows of one exception to this rule; in America *(H. egretta)* the train is usually longer, extending about 150 mm beyond the end of the tail, and the bill is chiefly yellow (Baird, Brewer & Ridgway, Water B. N. Am. 1884, I, p. 23). From the other White Herons occurring in Celebes the present species may be most readily distinguished by its large size, the wing always exceeding 300 mm (330—390 mm) in length.

First, following Salvadori, we allowed the Great White Egret of Indo-China and Australia specific distinction from the typical *H. alba*, viz. as *H. torra*. Stejneger, Taczanowski, and Seebohm make it a subspecies. In respect of such forms as this it is, unhappily, almost impossible to avoid dogma, the confessed dogma in this case being the line of geographical separation assumed to exist between *alba* and *torra*. Quite recently Sharpe in his Catalogue of the Herons has laid down a fresh line of geographical separation, in that he cuts off a large piece of Salvadori's range for *torra*, namely the Indian countries

and Ceylon. Sharpe makes a clear distinction between his eastern and western species, — the bill of the former is said to be yellow in summer and winter, in the latter it is black in summer. Unfortunately this statement is not correct, except as regards New Zealand. Stejneger *(j 1)* and Taczanowski *(k 1)* have shown that in Japan and Corea the bill is black in the nuptial season — sometimes, if not always. Sharpe's specimens from these regions are all in winter (or young?) plumage, except one, which may not, when killed (April 22), yet have assumed the black bill.

The beautiful Great White Heron seeks its food in marshes and water (preying on frogs, fish, worms, and such like). In all quarters (e. g. South Africa, Ceylon, New Zealand, America) it is an extremely shy bird, and with good reason, for few species have better cause to shun mankind, by whom its wholesale destruction is brought about in the breeding season for the sake of its dorsal feathers. In captivity the bird becomes very tame. Each of the ornamental feathers consists simply of a long white shaft with the barbs separated, lengthened and thread-like, growing alternately on either side at intervals of about 4 mm; the barbules are to be seen with a magnifying glass on the sides of the rami. On a long plume we find about 70 barbs on one side of the shaft; on an ordinary contour-feather from the same region about 110 barbs, on a second one about 120. It appears that the abnormal lengthening of the shaft of the ornamental feather has been accompanied by a reduction in number of the barbs (probably from the distal end of the feather). It is hard to imagine how some of the feathers of the upper back, of all places, can have become originally stimulated to such an aberrant increase in size; but the circumstance that the Herons rest the head and long neck between the shoulders when in flight and sleeping may possibly be worthy of mention in connection with it.

354. HERODIAS INTERMEDIA (Wagl.).

Lesser White Egret.

a. **Ardea intermedia** [Hasselt in lit.]; *(1)* Wagl., Isis 1829, 659; *(2)* Schl., Mus. P.-B., Ardeae, 1863, 352; *(3)* Finsch & Hartl., Vög. N.-O. Afr. 1870, 686; *(4)* Rchw., J. f. O. 1877, 273; *(5)* Rosenb., Malay. Archip. 1878, 278; *(6)* id., Zool. Garten 1881, 167; *(7)* W. Blas., J. f. O. 1883, 126; *(8)* Vorderm., N. T. Ned. Ind. 1883, XLIII, 230; *(9)* Seeb., Ibis 1884, 268; *(10)* id., B. Japan 1890, 217; *(11)* Steere, List Coll. B. & M. Philipp. 1890, 26; *(12)* Newton, Dict. B. 1893, 419.

b. **Ardea melanopus** *(1)* Wagl., Isis 1829, 659.

c. **Ardea egrettoides** *(1)* Temm. (nec Gm.), Man. d'Orn. IV, 314 (1840); *(II)* T. & Schl., Faun. Jap. Aves 1850, 115, pl. 69.

d. **Herodias plumiferus** *(1)* Gould, P. Z. S. 1847, 221; *(II)* id., B. Austr. 1848, VI, pl. 57.

e. **Herodias flavirostris** (Temm.) *(1)* Gray, List Grallae Br. Mus. 1844, 78.

Herodias intermedia *(1)* Blyth, Cat. B. Mus. A. S. B. 1849, 279; *(2)* Swinh., P. Z. S. 1863, 319; *(3)* Salvad., Cat. Ucc. Borneo 1874, 348; *(4)* Hume, Str. F. 1874, II, 303;

(5) Wald., Tr. Z. S. 1875, IX, 237; ? *(6)* Ayres, Ibis 1877, 349; *(7)* David & Oust., Ois. Chine 1877, 440; *(8)* Hume, Str. F. 1878, VI, 476, 480; *(9)* Tweedd., P. Z. S. 1878, 954; *(10)* Legge, B. Ceylon 1880, 1141; *(10bis)* Meyer, Verh. z.-b. Ges. Wien 1881, 767; *(11)* Salvad., Orn. Pap. 1882, III, 352; *(12)* Oates, B. Brit. Burmah 1883, II, 247; *(13)* H. Parker, Ibis 1883, 194, 195; *(14)* Nicholson, t. c. 256; *(15)* Meyer, Isis, Dresden 1884, 56; *(16)* C. Swin. & Barnes, Ibis 1885, 136; *(17)* Parker, Ibis 1886, 188; ? *(18)* Symonds, Ibis 1887, 335; *(19)* Rams., Pr. L. Soc. N. S. W. 1887, 172; *(20)* Büttik., Notes Leyden Mus. 1887, 81; *(21)* Stejn., Pr. U. S. Nat. Mus. 1887, X, 315; *(22)* Rams., Tab. List 1888, 21; *(23)* Sharpe, Ibis 1888, 203; *(24)* Hume, Str. F. 1888, XI, 333; *(25)* Everett, J. Str. Br. R. A. S. 1889, 189; *(26)* Whitehd., Ibis 1890, 60; *(27)* Oates, ed. Hume's Nests and Eggs 1890, III, 240; *(28)* Styan, Ibis 1891, 327, 492; *(29)* Salvad., Orn. Pap. Agg. 1891, 206; *(30)* Vorderm., N. T. Ned. Ind. 1891, L, 517; *(31)* id., Notes Leyden Mus. 1891, 129; *(32)* Bns. & Worces., B. Menage Exped. 1894, 32; *(33)* Vorderm., N. T. Ned. Ind. 1895, LIV, 322.

f. **Herodias egrettoides** *(1)* Swinh., Ibis 1861, 261; *(2)* Jerd., B. India III, 745 (1864); *(3)* Gld., Hb. B. Austr. 1865, II, 303.

g. **Egretta intermedia** Bp.; *(1)* Seeb., Ibis 1879, 27.

h. **Mesophoyx intermedia** *(1)* Sharpe, Bull. B. O. C. 1894, p. 38, April; Ibis 1894, 432; *(2)* id., Cat. B. 1898, XXVI, 85.

i. ? **Mesophoyx brachyrhyncha** *(1)* Sharpe, Cat. B. 1898, XXVI, 87.

j. **Mesophoyx plumifera** *(1)* Sharpe, l. c.

"Swekko puti mulu itam", Lake Tondano, Malay, Nat. Coll.

"Pokok kulu remdeng kukulat", Lake Tondano, Nat. Coll

For further synonymy and references cf. Salvadori *11.*

Figures and descriptions. Gould *d II*; Temminck & Schlegel *c II*; Schlegel *a 2*; Finsch & Hartlaub *a 3*; Hume *8*; Legge *10*; Salvadori *11*; Oates *12*; Vorderman *a 8*; etc.

Breeding plumage. Entirely white; no occipital crest; dorsal train of much lengthened decomposed feathers, overreaching the tail by about 100 mm; a bunch of very long (about 160 mm) decomposed feathers on jugulum; bill yellow, tip of upper mandible blackish, terminal 10 mm of tomia serrated; legs and feet black (Kakas, Lake Tondano, June, 1871: Meyer — C 2006).

The specimen described is moulting its remiges, therefore not yet in full nuptial dress. Hume, Legge and Oates say the bill is black at that time (India, Ceylon, Burmah), Seebohm says it is always more or less dark at the point and yellow at the base of both mandibles (Japan).

A specimen from South Celebes in breeding plumage has the soft parts and measurements in the flesh as follows, according to Platen: "Iris light yellow; bill and feet black. Length 60.5 cm, expanse 103 cm" (♀, Maros Waterfall, 23. Feb. 1878 — C 5382). The basal 6 mm of the culmen were evidently yellow.

Winter plumage. Without the dorsal train and decomposed jugular feathers; bill entirely yellow (Lake Tondano: Aug.—Sept. 1892: Nat. Coll. — C 10973).

Measurements.	Wing	Tail	Tarsus	Mid. toe and claw	Exp. culmen
a. (C 2006) ad., Lake Tondano, June, 71 (Meyer)	303	123	115	100	76
b. (C 10973) ad., Lake Tond., Aug.—Sept. 92 (N. C.)	290	—	100	90	78
c. (C 10972) ad., Lake Tond., Aug.—Sept. 92 (N. C.)	291	116	100	94	79
d. (C 5382) ♀ ad., Maros, 23. Feb. 78 (Platen) .	291	123	101	86	70

Eggs. According to Hume these are decidedly paler sea- or bluish green than those of *H. alba*, *A. cinerea* and *purpurea*; in shape often very perfect and rather broad ovals: 43—53 × 34—39 mm *(27)*.

Nest. On trees, in thickets, or among rushes, where it often breeds in dense colonies with other Herons, making a nest of twigs (Hume *27*).

Distribution. Africa; the Indo-Chinese countries; the East India Islands and Australia. Japan (Siebold *c II*, Blakiston & Pryer *a 10*); China (Swinhoe *2*, Styan *28*, etc.); India (Jerdon, Hume, etc. *f 2, 10, 11*); Ceylon (Legge, etc. *10*); Andamans (Wardlaw Ramsay *11*, Hume & Davison *4*); Burmah (Feilden *10*, Oates *12*); Sumatra (H. O. Forbes *14*, Klaesi *20*); Java (v. Hasselt *a 2*, Vorderman *a 8*); Noordwachter Is. (Vorderman *33*); Sumba (Riedel *10bis*); Billiton (Vorderman *30*, *31*); Borneo — Sarawak (Doria & Becc. *3*, *25*); Philippines — Palawan (Whitehd. *23*, *26*), Bohol and Samar (Steere *a 11*), Mindoro (Bourns & Worcester *32*), Mindanao (Everett *9*); Celebes — Minahassa (Meyer *15*, Nat. Coll.), Gorontalo District (v. Rosenberg *a 5*, *a 6*), South Peninsula (Platen); Moluccas — Ternate (Bruijn *11*); Papuasia — Salawatti, Mafoor, Kei, Aru (fide Salvad. *11*); Is. of Torres Str. (McGillivray *11*); Australia (Gould *d II*, *f 3*, Ramsay *22*).

In his list of birds obtained at Lake Limbotto in 1863—64 Rosenberg *(a 6)* mentions 9 examples of this Egret. One was obtained by Meyer at Lake Tondano, and two were sent to the Dresden Museum recently from the same spot by our native collector. A specimen from the Maros Waterfall from Platen establishes the occurrence of the species in South Celebes.

The Lesser White Egret has a wide range, being found both in East, South, and West Africa, as well as in the countries of Asia and Australasia mentioned above. It is not stationary in all parts of its range. David says that it visits North China (Pekin) in the summer, though it is resident in Central and South China, and Seebohm speaks of it as a summer visitor to Japan. According to Whitehead it is a winter visitor to Palawan. It will be seen that the specimens known from Celebes were obtained both in winter and summer.

The best means of distinguishing this species from the allied White Egrets of Celebes is to be found in its long toes, which considerably exceed the bill in length, a condition seen also in *Bubulcus coromandus*, but that species, when pure white, may be recognised by its smaller size and short bill. Serrations of the cutting edges of the bill near the tip are slightly more apparent than in *H. alba*, though less so than in *Bubulcus*. In the breeding season *H. intermedia* is more easy to distinguish, since its dorsal train is usually much longer than in the other Egrets, it has no occipital crest (in which point it differs from *H. garzetta* and *eulophotes*), and it is furnished with a quantity of long decomposed plumes on the jugulum (not seen in *H. alba*, and which are lanceolate in *garzetta* and *eulophotes*). At this season *H. intermedia*, like *H. alba*, gets a black, or chiefly black, bill; in winter the bill is yellow. Dr. Sharpe makes a new genus for it, *Mesophoyx*, but the student will find that it requires much care to distinguish the white Egrets specifically, not to speak of genera; moreover,

Sharpe's diagnosis applies equally well to *Bubulcus* when the birds are not in breeding plumage[1]).

The Lesser Egret seems to be a fresh-water species, as its light structure suggests. Legge describes it as haunting paddy-fields, marshes and flooded lands; it is shy and very silent, and feeds mostly on fish.

GENUS BUBULCUS Bp.

The Cattle Egret differs remarkably in habits from the Egrets of the genus *Herodias*, being chiefly insectivorous in regard to its food; yet it is difficult to point to any strongly pronounced characters wherewith to distinguish it generically as *Bubulcus*. Its hind toe with the claw is relatively longer than in *Herodias* and *Demiegretta*, being just equal to the inner toe without the claw; its bill is short, one-fourth the length of the wing, rather stout, the cutting edges terminally serrated, the ridge of the gonys about one-fourth the length of the bill from the gape (as against about one-third in *Herodias*).

In plumage it is not perfectly white in non-breeding dress, but has the top of the head buff; and in breeding dress the filamentous plumes, besides being golden-tawny in colour, are of a different character from those of *Herodias*.

355. BUBULCUS COROMANDUS (Bodd.).

Cattle Egret.

a. **Le Crabier de Coromandel** *(1)* Buff., H. N. Ois. (small fol. ed.) 1783, VIII, 226, pl. 910.
b. **Cancroma coromanda** *(1)* Bodd., Tabl. Pl. Enl. 1783, p. 54.

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[1]) After this article was written, Dr. Sharpe had the kind courtesy to send us some of the proof-sheets of his Catalogue of the Herons, wherein he handles this species in a manner differing in many respects from ours. What we, like Legge, Salvadori, and others, regard as one species, Sharpe treats of as three, the birds of the Indian Region being *Mesophoyx intermedia*, those of Africa *M. brachyrhyncha* (Brehm), and those of the Australian Region *M. plumifera* (Gld.), the geographical dividing line between the last and the first being assumed to be between Celebes on the one side and Java and the Philippines on the other. We cannot decide to remodel our work to conform with Dr. Sharpe's touching *M. intermedia* and *plumifera*. As to whether African individuals are racially distinct or not, we have no opinion, but would only point out that the characters on which *M. brachyrhyncha* is upheld are perhaps of a seasonal, evanescent nature: these are the "yellow" (? yellowish) tibia, a yellow bill and a black patch (in skin) in front of the eye. Now Legge points out (see also our table under *Bubulcus coromandus*) that the tibiae of Ceylon birds are in breeding plumage yellowish brown (Dr. Sharpe wrongly says "entirely black like the tarsi and toes"); and two of our Celebesian specimens with yellow bills have a blackish mark on the loral skin (perhaps a result of drying), also yellowish tibiae, and one is in partial breeding dress — this should be *M. brachyrhyncha!* In the same way *M. plumifera* is allowed to stand as a good species by reason of its yellow (? yellowish brown) tibiae and yellow bill and facial skin when in breeding plumage. This form seems to us to be *Herodias intermedia* not yet in full nuptial dress, the black of the bill being, apparently, the last adjunct to the breeding characters; a specimen from Celebes in this dress is described above, but another from there in breeding plumage with a nearly black bill will be found mentioned. Moreover, in some of the Oriental countries *H. intermedia* is known as a migrant (for instance, in Palawan — according to Whitehead), and we know of no proof as yet, even, whether the Australian birds are not simply visitors to the country from the north. It seems more likely that they are for the most part resident and fairly stationary; therefore, perhaps with racial distinctions, but, until this is proved to be the case by sufficient specimens and observations, we prefer not to split up *H. intermedia* as Dr. Sharpe has done.

c. **Ardea russata** *(1)* Wagl., Syst. Av. gen. Ardea 1827 sp. 12; *(2)* Temm. & Schl., Faun. Jap. Aves 1850, 115.

d. **Ardea coromanda** *(1)* Gray, Gen. B. 556, III, Nr. 39 (1847 — syn. emend.); *(2)* Schl., Mus. P.-B., Ardeae, 1863, 30; *(3)* Finsch & Conrad, Verh. z.-b. Ges. Wien 1873, 3, 18 (sep. c.); *(4)* Brügg., Abh. Ver. Brem. 1876, V, 97; *(5)* Rchw., J. f. O. 1877, 259; *(6)* Rosenb., Malay. Archip. 1878, 278; *(7)* id., Zool. Garten 1881, 167; *(8)* Seeb., B. Japan 1890, 219; *(9)* Oust., Nouv. Arch. du Mus. 1894, 87.

e. **Buphus coromandus** *(1)* Swinh., Ibis 1860, 64; *(2)* id., ib. 1863, 419; *(3)* Jerd., B. Ind. III, 749 (1864); *(4)* Hume, Str. F. 1878, VI, 481; *(5)* Wardl. Rams., Tweedd. Orn. Works 1881, 660.

Bubulcus coromandus *(1)* Gray, HL. 1871, III, 30, Nr. 10133; *(2)* Meyer, J. f. O. 1873, 405; *(3)* Salvad., Cat. Ucc. Borneo 1874, 350; *(4)* Hume, Str. F. 1874, II, 309; *(5)* David & Oust., Ois. Chine 1877, 441; *(6)* Meyer, Ibis 1879, 144; *(7)* Legge, B. Ceylon 1880, 1147; *(8)* Tweedd., Orn. Works 1881, 399, 413, 619, 625; *(9)* Salvad., Orn. Pap. 1882, III, 357; *(10)* A. Müll., J. f. O. 1882, 436; *(11)* W. Blas., ib. 1883, 118, 140; *(12)* Nichol., Ibis 1883, 257; *(13)* Oates, B. Brit. Burmah 1883, II, 251; *(14)* Meyer, Isis, Dresden 1884, 6, 57; *(15)* Vorderman, N. T. Ned. Ind. 1885, XLIV, 236; *(16)* W. Blas., Z. ges. Orn. 1885, 318; *(17)* Gigl., Avif. Ital. 1886, 281; *(18)* Sclat. & Saund., Ibis 1886, 517; *(19)* Stejn., Pr. U. S. Nat. Mus. 1887, X, 309; *(20)* Büttik., Notes Leyden Mus. 1887, 81; *(21)* W. Blas., Ibis 1888, 374; *(22)* id., Ornis 1888, 330, 631; *(23)* Hume, Str. F. 1888, XI, 333; *(23bis)* Gigl., Avif. Ital. pt. I, 1889, 438; *(24)* Everett, J. Str. Br. R. A. S. 1889, 189; *(25)* Hartert, J. f. O. 1889, 406; *(26)* Hicks., Nat. in N. Celebes 1889, 219; *(27)* Whitehd., Ibis 1890, 60; *(28)* Sh. & Whitehd., t. c. 146; *(29)* Steere, List. Coll. B. & M. Philipp. 1890, 26; *(30)* W. Blas., J. f. O. 1890, 139; *(31)* Hagen, T. Ned. Aard. Genoots. 1890, (2) VII, 166; *(32)* Oates, ed. Hume's Nests & Eggs 1890, III, 247; *(33)* Styan, Ibis 1891, 327, 492; *(34)* Salvad., Orn. Pap. Agg. 1891, 206; *(35)* id., Ann. Mus. Civ. Gen. (2) 1891, XII, 77; *(36)* De la Touche, Ibis 1892, 488, 489; *(37)* Meyer, Notes Leyden Mus. 1892, 267; *(38)* Büttik., Zool. Erg. Weber's Reise 1893, III, 284; *(39)* Tacz., Faun. Orn. Sib. Orient. 1893, II, 985; *(40)* Sharpe, Ibis 1894, 243, 258; *(41)* M. & Wg., J. f. O. 1894, 253; *(42)* Bourns & Worc., B. Menage Exped. 1894, 32; *(43)* Everett, Ibis 1895, 32; *(44)* Grant, t. c. 267; *(45)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 19; *(46)* Hart., Nov. Zool. 1896, 164, 181; *(47)* Sharpe, Cat. B. 1898, XXVI, 217.

f. **Herodias egretta** *(1)* Lenz (nec Gm.), J. f. O. 1877, 380.

g. **Herodias nigripes** *(1)* Meyer (nec Temm.), Verh. z.-b. Ges. Wien 1881, 767.

"Baroa adioa" (as also *H. garzetta*), Kabruang, Talaut; Nat. Coll.

"Swekko puti mulu kuning", Minahassa, Malay, iid.

"Pokok kulu riri kukulat", Minahassa, iid.

"Condor pakampi", Maros and Tjamba Distr., S. Celebes, Platen *16*.

For further synonymy and references cf. Salvadori *9*; Stejneger *19*; Sharpe *47*.

Figure and descriptions. Buffon *a I*; Schlegel *d 2*; Legge *7*; Salvad. *9*; Oates *13*; Vorderman *15*; Taczanowski *39*; Sharpe *47*; etc.

Non-breeding plumage. White, the head above washed with buff, a slight buff tinge on the back; cutting edges of bill terminally serrated; "bill and cere light yellow; iris golden; legs black; soles of feet greenish yellow": P. & F. Sarasin (♀, Tomohon, 28. III. 94; ad. Lake Tondano, Aug.—Sept. 92: Nat. Coll. — C 10977).

Breeding plumage. The feathers of the head, neck, jugulum, and back much lengthened, decomposed and hair-like, in colour golden tawny, paler on the back, the filamentous

plumes of which extend to the end of the tail and beyond it; in other respects white, as when not breeding; "tibia yellow" (Legge); tarsus pale, becoming black towards the foot; bill as in winter (ad. Lake Tondano, Aug.—Sept. 92: Nat. Coll. — C 10975).

Female. Appears to be smaller than the male.

Measurements (12 apparently adult birds from the Celebesian area). Wing 232—265 mm; tail c. 80—100; tarsus 79—90; middle toe with claw c. 75—83; exposed culmen 56—62.

Eggs. "The East-Indian eggs of my collection are paler than the ordinary Heron eggs and measure 45 × 35 mm" (Nehrkorn MS.).

Hume finds them distinguishable as a body from all the other Indian Herons' eggs by their very pale colour: white, with a faint blue or green tinge; varying much in size and shape, but typically rather broad ovals, somewhat pointed towards one end *(32)*.

Nest. Of sticks, built in trees, often in company with those of other White Egrets *(32)*. In Celebes they nest in the reeds, laying two or three eggs (Meyer *6*).

Distribution. South Japan (Pryer, etc. *d 8*); Formosa (Swinhoe *e 2*); S. E. Siberia — Ussuriland (Kalinowski *39*); Central and South China (Swinhoe, David, etc. *e 1, 5, 33, 36*); West China or Tibet (Bonvalot & D'Orleans *d 9*); Caspian Sea (fide Scl. & Saund. *18*); India (Jerdon, etc. *e 3, 7, 32*); Ceylon (Legge, etc. *7*); Burmah (Oates *13*); Tenasserim (Davison *e 4*); Cochin China (Giglioli *17*, Oates *13*); Danger Id. off Siam (Conrad *d 3*); Andamans (Davison *4*); Malay Penins. — Salanga and Perak (Hartert *25*); Sumatra (Bock *9*, H. O. Forbes, etc. *12, 20, 31, 35*); Java (Horsfield, S. Müller, etc. *9, d 2, 15*); Sumba (Riedel *g 1, 37*); Timor (Wallace *9*); Borneo (Doria & Beccari, etc. *3, 24, 28*); Philippine Is. (Jagor, etc. *8, 9, 21, 22, 24, 29, 40, 42*); Talaut Is. — Kabruang (Nat. Coll. *41*); Sangi Is. — Gt. Sangi (Meyer *14, 22*); Celebes: — Minahassa (Meyer, etc. *2, 6, d 4, 45*), Gorontalo (v. Rosenb. *6, 7*), S. Peninsula — Tjamba and Maros Waterfall (Platen *16*), Tanette (Weber *38*), Bulekomba (Everett *46*); Saleyer (id.); Buru, Ternate, Batchian (fide Salvad *9, 34*); ? Italy (Giglioli *17*); Shoa in Abyssinia (Traversi *23bis*).

The Cattle Egret is to be seen in flocks in North Celebes, where, as elsewhere, it is remarkable for its habit of perching on the backs of horses and cattle *(6)*. To these it is a welcome guest, for the ticks, which infest their hides, together with flies, maggots, etc., form part of its food. Legge remarks, however, that its position on the backs of the animals seems to be one of rest, for he has never seen it take anything when so seated, though he has observed it at other times, picking ticks from the animals' legs. Besides the food above mentioned Legge adds that it devours grasshoppers, beetles, bugs *(Hemiptera)*, locusts, frogs, crustacea; it feeds "but, rarely, I think, on fish". A great difference between it and the White Egrets, which it so much resembles in general appearance, is to be seen in its food and habits.

Its numbers in Celebes are probably much increased by migration from the north during the winter.

Although the proper range of this species seems to be India and China down to Timor and the Moluccas, it has been recorded by Sclater & Saunders from the shores of the Caspian Sea (collector's name not mentioned), and by Giglioli from Abyssinia, and even from Italy.

Its nearest affinities are with *Bubulcus ibis* of Africa, Southern Europe and S. E. Asia (Palestine); this bird has shorter toes and in summer yellow legs (in winter dark brown or dull blackish grey — Dresser), and some differences in coloration when breeding.

The changes in colour of the bill and feet according to the season in some of these Eastern Herons are of a curious character; Hume has already written on the subject (Str. F. 1878, VI, 473, 480).

The following scheme shows the seasonal variation in the Celebesian Egrets:

	Bill		Legs	
	Breeding	Non-breeding	Breeding	Non-breeding
Herodias alba . . .	Black	Yellow	Black, tibiae reddish brown	Black
Herodias intermedia .	Black, yellow at base	Yellow	Black, tibiae yellowish brown	Black
Herodias garzetta . .	Black	Black, yellow at base of lower bill	Black	Black
Herodias eulophotes .	Yellow	Dark brown, yellowish towards base	Black	Greenish brown
Bubulcus coromandus	Yellow	Yellow	Yellowish above, black towards foot	Black

GENUS ARDEOLA Boie.

Size small; the tarsus shorter than the middle toe and claw; the wings white. The latter character, contrasting with the coloured plumage, at once distinguishes it from the other Herons.

356. ARDEOLA SPECIOSA (Horsf.).

Sundan Squacco Heron.

a. **Ardea speciosa** *(1)* Horsf., Tr. Linn. Soc. 1821, XIII, 189; *(II)* id., Zool. Research. in Java 1824, pl. 62; *(3)* Less., Man. d'Orn. 1828, II, 240; *(4)* S. Müll., Reizen Ind. Archip. 1858, II, 13; *(5)* Brügg., Abh. Ver. Bremen 1876, V, 96, 464; *(6)* Rchw., J. f. O. 1877, 258, 277; *(7)* Rosenb., Malay. Archip. 1878, 278; *(8)* id., Zool. Garten 1881, 167; *(9)* Platen, Gefied. Welt 1887, 206.

b. **Ardea pseudoralloides** *(1)* Brehm, Vög. Deutschl. (fide Rchw. *a 6*).

c. **Ardea malaccensis** *(1)* Less., Tr. d'Orn. 1831, 573, pt.

Ardeola speciosa *(1)* Gray, List Gen. B. 1841, 86; *(2)* Swinh., Ibis 1860, 65; *(3)* Blyth, Ibis 1865, 38; *(4)* Gray, HL. 1871, III, 30, Nr. 10138; *(5)* Wald., Tr. Z. S. 1872, VIII, 98; *(6)* id., Ibis 1874, 149; *(7)* Salvad., Cat. Ucc. Borneo 1874, 351; *(8)* Hume, Str. F. 1878, VI, 482; *(9)* Legge, B. Ceylon 1880, 1151; *(10)* Meyer,

Verh. z.-b. Ges. Wien 1881, 767; *(11)* Oates, B. Brit. Burmah 1883, II, 253; *(12)* W. Blas., J. f. O. 1884, 216, 219; *(13)* Kutter, t. c. 224; *(14)* W. Blas., Ztschr. ges. Orn. 1885, 206, 319; *(15)* Vorderm., N. T. Ned. Ind. 1885, XLIV, 202, 237; *(16)* Stejn., Pr. U. S. Nat. Mus. 1887, X, 308; *(17)* Burck, N. T. Ned. Ind. 1889, XLVIII, 116; *(18)* Everett, J. Str. Br. R. A. S. 1889, 189; *(19)* Sharpe, Ibis 1890, 147, 285; *(20)* Hartert, Kat. Senckenb. Mus. 1891, 202; *(21)* id., Ornis 1891, 123; *(22)* Vorderm., N. T. Ned. Ind. 1892, LI, 412; *(23)* Büttik., Zool. Erg. Weber's Reise 1893, III, 284; *(24)* Vorderm., N. T. Ned. Ind. 1895, LIV, 323, 352; *(25)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 15; *(26)* Hart., Nov. Zool. 1896, 164, 598; *(27)* Sharpe, Cat. B. 1898, XXVI, 212.

d. **Buphus speciosus** *(1)* Bp., Consp. 1855, II, 127; *(2)* id., Compt. Rend. 1855, XL, 722, Nr. 90.

e. **Ardea leucoptera speciosa** *(1)* Schl., Mus. P.-B., Ardeae, 1863, 34.

f. **Ardeola leucoptera** *(1)* Guillem. (nec Bodd.), P. Z. S. 1885, 511, 561.

"Duduhu", Gorontalo, Rosenb. *a 7*; Joest, Holontalo 1833, 105.

"Condor pura", Maros and Tjamba, S. Celebes, Platen *14*.

Figure and descriptions. Horsfield *a II*; Lesson *a 3*; Bonaparte *d 1*; Hume *8*; Vorderm. *15*; Sharpe *27*.

Breeding plumage. Head, neck and jugulum cinnamon, lightest on the head, more cinnamon-rufous on neck, darkest, with a purpurescent brown hue on jugulum where the feathers are broad, lengthened and decomposed; an occipital crest of four or five buff-white elongated feathers (c. 60—100 mm or more); chin, cheeks and upper throat white; back blackish slaty, washed with a hoary grey, the feathers decomposed, very broad and elongated, stretching beyond the tail; wings, lower back, rump, tail, and entire under parts white, scapulars washed with buff, becoming deeper buff on shoulders; "iris light yellow; tip and [culmen] base of bill black, the rest bluish [in the dry skin yellowish white]; feet pale yellow": Platen *14* (♂, Maros Waterfall, S. Celebes, 16. II. 78: Platen — C 13227).

Winter plumage. Head, neck and jugulum dusky black, streaked with buff, the buff increasing in extent on the neck, and almost uniform buff-cinnamon on the jugulum; no occipital crest; back, scapulars and inner remiges purplish brown, the dorsal feathers lengthened and terminally decomposed; the remaining parts white as in summer; upper bill and tip of under bill blackish, base of lower and adjoining part of upper bill yellowish (Java: v. Schierbrand — C 12423).

Young. Like the adult in non-breeding plumage, but the buff stripes of the head broader and the back paler and greyer brown (♀, Macassar, Oct. 71: Meyer — C 1995).

Observation. Several specimens, striped on the head like the young described, are assuming the long slaty dorsal feathers of breeding plumage. They may be adults changing from winter dress, but we take them rather for young putting on breeding plumage at the beginning of their second year.

Sexes. Sexual differences of coloration are not known to exist.

Measurements.	Wing	Tail	Tarsus	Mid. toe and claw	Exposed culmen
a. (C 13227) ♂ ad., S. Celebes, 16. II. 78 (Platen)	205	79	52	57	59
b. (C 14290) ad., Gorontalo (Riedel)	212	77	56	—	62
c. (C 3541) ? vix ad., Minahassa (Faber) . . .	208	81	—	—	62
d. (C 1995) juv. ♀, Macassar, Oct. 71 (Meyer)	190	63	53	59	57
e. (Nr. 11251) ad., Java (v. Schierbr.) . . .	206	—	57	63	61
f. (Nr. 11587) ad., Java (v. Schierbr.) . . .	195	73	53	57	57

Measurements (continued).	Wing	Tail	Tarsus	Mid. toe and claw	Exposed culmen
g. (Nr. 11588) ad., Java (v. Schierbrand) . .	194	74	—	—	55
h. (Nr. 11228) ad., Java (v. Schierbr.) . . .	190	67	—	—	60
i. (Nr. 11229) ? juv., Java (v. Schierbr.) . . .	186	65	52	60	61
j. (C 12423) ? vix ad., Java (v. Schierbr.) . .	207	74	57	—	62
k. (C 12422) ? vix ad., Java (v. Schierbr.) . .	203	75	54	60	60
l. (C 6272) ad., Sumba (Riedel)	210	75	59	64	62
m. (C 6273) ? vix ad., Sumba (Riedel)	202	77	57	64	63

The examples from Java and Sumba (with one exception, *f*) have the tips of the outer one or two primaries clouded with a variable amount of drab; this is seen in two of the Celebesian examples *(b, d)*, in the two others not so.

Eggs. "Borneo eggs in my collection are bluish and measure 36×30.5 mm" (Nehrkorn MS.). Grabowsky found 4 eggs to the sitting on 25th April, 1882 *(13)*.

Nest. Of grass, carelessly built and flat, lying on the marsh-grass clumps standing above the surface of the water (Banks of the swamp of Danau Bangkau, S. E. Borneo: Grabowsky in Kutter *13*).

Distribution. Java (Horsfield *a 1, a II*, Reinwardt *e 1*, etc.); Noordwachter Id. (Vorderm. *24*); Karimon-Java Islands (Burck *17*); Lombok (Vorderman *24*, Everett *26*); Sumbawa (Forsten *e 1*, Guillemard *f 1*); Sumba (Riedel *10*); Borneo (Schwaner, etc. *e 1, 7, 12, 18, 19*); Celebes: — (Wall.), Minahassa (Faber), Gorontalo (Rosenb. *a 7, a 8, a 5*, Riedel *14*, Guillem. *f 1*), Southern Peninsula — Tjamba Distr. (Platen *14*), Maros Waterfall (Platen *14*), Macassar (Weber *23*, P. & F. Sarasin *25*, Everett *26*), Tello, Maros and Tempe (Weber *23*), Buton Id. (S. Müller *a 4*).

This Egret is a common species in South Celebes, where Dr. Platen *(14)* says "dozens of Herons of about six species, *A. speciosa*, *Ardea purpurea*, *Herodias garzetta*, *Bubulcus coromandus*, *Ardetta cinnamomea* and *Ardeiralla flavicollis*, splendid contrasts in colour and size, follow the plough as it turns up the bottomless mud of the rice fields". *Ardeola speciosa* may be easily recognised among all its fellow Herons in Celebes, when in breeding plumage, by the decomposed slaty plumes of its back and by its white body and wings; the white wings and body equally serve to distinguish it when young, or in non-breeding dress. "Often enough", says Mr. Whitehead *(19)*, "when passing a field, you do not observe this little Heron until suddenly dozens of snow-white wings (the small and dull-coloured body being difficult to see) open and slowly flap away".

The nearest affinities of this species are with the Chinese Squacco Heron, *A. prasinosceles* Swinh. (= *bacchus* Bp.) of S. China, and the Siamese and Malay Peninsulas; the latter, according to Hume, is a larger bird with the crest rich vinous chestnut, and some other differences. *A. grayi* of the Indian countries has the long feathers of the back deep maroon-purple, a greyer hue on the head and neck, etc.

The Squacco Heron, *A. ralloides* (Scop.), of Europe and Africa is the type of the genus *Ardeola* Boie, which its author just saves from the condition of a nomen nudum by giving as its distinguishing mark: its short "toes" (it should have been "tarsus").

Ardeola has the tarsus shorter than the middle toe and claw, whereby it may be distinguished from many of the large Herons, as from *Bubulcus* and *Herodias*, but the most handy mark of distinction is found in the white wings. *A. speciosa* also differs widely from the type of its genus, *A. ralloides*, which has an occipital crest of an abundance of lanceolate feathers (not simply about four), the first primary more pointed and scarcely shorter than the longest (it is a migratory species), etc. *Ardeola* appears to us to have affinities with the Egrets *(Herodias)* on the one side and with the Night Herons *(Nycticorax)* on the other. Seebohm, indeed, includes the Chinese Squacco Heron, *Ardeola prasinosceles*, in the genus *Nycticorax* (B. Japan 1890, 225), but the true Night Heron differs in having the bill much more massive, the neck shorter, the wing more pointed, the 3—4 outer primaries notched on the inner web, no dorsal breeding train, and in other points.

GENUS NYCTICORAX Raf.

As a genus *Nycticorax* may be recognised by its stout, strong bill, the height of which is about $^1/_3$ the length of the culmen, the tomia obscurely serrated; the tarsus is covered with irregular scales; the head is black (slate, etc.) above, with three or more very long narrow feathers sprouting from the nape, which sometimes fold into one another, so as to look like a single plume. In habits nocturnal.

357. NYCTICORAX CALEDONICUS (Gm.).

Nankeen Night Heron.

a. **Caledonian Night Heron** *(1)* Lath., Gen. Syn. 1783, III, 55.

b. **Ardea caledonica** *(1)* Gm., S. N. 1788, I, 626; *(2)* Schl., Mus. P.-B., Ardeae, 1863, 59; *(3)* Rosenb., Zool. Garten 1881, 167.

Nycticorax caledonicus *(1)* Steph., Gen. Zool. 1819, XI, 613; *(II)* Gould., B. Austr. 1848, VI, pl. 63; *(3)* id., Hb. B. Austr. 1865, II, 311; *(4)* Wald., Tr. Z. S. 1872, VIII, 100, 114; *(5)* Salvad., Ann. Mus. Civ. Gen. 1875, VII, 681; *(6)* Brügg., Abh. Ver. Bremen 1876, V, 98; *(7)* Rchw., J. f. O. 1877, 238; *(8)* Rosenb., Malay. Archip. 1878, 278; *(9)* Meyer, Ibis 1879, 143; *(10)* id., Verh. z.-b. Ges. Wien 1881, 771; *(11)* Tweedd., Orn. Works 1881, 199, 400, 542; *(12)* Salvad., Orn. Pap. 1882, III, 372; *(13)* Nicholson, Ibis 1882, 69; *(14)* E. L. & L. C. Layard, t. c. 531, 544; *(15)* W. Blas. & Nehrk., Verh. z.-b. Ges. Wien 1882, 431; *(16)* W. Blas., J. f. O. 1883, 133; *(17)* Rams., Pr. L. Soc. N. S. W. 1883, 55, 88; *(18)* Meyer, Isis, Dresden 1884, 57; *(19)* Sharpe, Rep. Voy. Alert 1884, 28; *(20)* W. Blas., Ztschr. ges. Orn. 1885, 324; *(21)* Stejn., Pr. U. S. Nat. Mus. 1887, X, 297; *(22)* Rams., Pr. L. Soc. N. S. W. 1887, 172; *(23)* id., Tab. List 1888, 21; *(24)* W. Blas., Ornis 1888, 632; *(25)* Buller, B. New Zeal. 2nd ed. 1888, II, 139; *(26)* North, Nests and Eggs B. Austr. 1888, 320, pl. XVIII, f. 1; *(27)* Studer, Voy. Gazelle 1889, III, 198; *(28)* Cox & Hamil., Pr. L. Soc. N. S. W. 1889, 421; *(29)* Seeb., B. Japan 1890, 223; *(30)* id., Ibis 1890, 107; *(31)* Salvad., Orn. Pap. Agg. 1891, 208; *(32)* Wiglesw., Av. Polyn. 1892, 68; *(33)* Meyer, J. f. O. 1892, 264; *(34)* Büttik.,

Zool. Erg. Weber's Reise 1893, III, 284; *(35)* M. & Wg., J. f. O. 1894, 116; *(36)* Nehrk., t. c. 161; *(37)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 2, p. 20; *(38)* Hart., Nov. Zool. 1896, 181; *(39)* Salvad., Ann. Mus. Civ. Gen. 1896, (2) XVI, 119; *(40)* Sharpe, Cat. B. 1898, XXVI, 158.

c. **Ardea ferruginea** *(1)* Forster (nec Gm.), Descr. An. 274 (1844).

d. **? Nycticorax gardeni** *(1)* S. Müll. (nec Gm.), Reiz. Ind. Archip. 1858, pt. II, 8.

e. **Nyctiardea caledonica** *(1)* Gray, HL., 1871, III, 33, Nr. 10172.

f. **? Nycticorax manillensis(?)** *(1)* Everett, J. Str. Br. R. A. S. 1889, 190.

"Swekko pakek tjatjing", or **"Swekko mera bertjatjing"**, Malay, Minahassa, Nat. Coll.

"Condor baka", Tjamba Distr., Platen *20*.

"Kaloang sagu", Banggai, Nat. Coll.

For further synonymy and references cf. Salvadori *12*, *31*; Sharpe *40*.

Figure and descriptions. Gould *II*, *3*; Schlegel *b 2*; Salvadori *12*; Buller *25*; Sharpe *40*.

Adult. Head above, sides of occiput, and hind neck slaty black; three very long (150—210 mm) narrow nuchal feathers white, blackish at base; upper parts cinnamon-rufous, palest on the rump, darkest and strongly tinged with vinous on mantle, back, and scapulars, inclining to fawn-colour on face, ear-coverts, sides of neck and of breast; chin, throat, middle of breast and under-parts white, the longer under wing-coverts vinous grey or cinnamon; "bare space surrounding the eye greenish yellow; irides orange; bill in some specimens black, slightly tipped with yellow, in others black with a streak of greenish yellow along the lower mandible, and a wash of the same hue along the lower edge of the upper one; legs and feet jonquil-yellow; claws black": Gould *II* (ad., Manado tua Id., 6. April, 1893: Nat. Coll. — C 12109).

Young. Streaked with brown and isabelline-buff: head above blacker brown with narrow shaft-streaks; sides of head and neck less dark with broad buff centre-streaks; the streaks changing into large terminal spots on the feathers of the back, scapulars, wing-coverts, rump, remiges and tail; the wing-coverts and inner remiges laterally vermiculated with cinnamon, tending to form bars; under-parts white, the feathers broadly fringed with brown except on the abdomen and under tail-coverts; "iris light yellow; bill above brown, below greenish; feet grey": Platen *20* (juv., Manado, March, 1871: Meyer — C 2009).

Bird of second year. Intermediate between the above-described young and the adult: head above black; no crest; upper parts rufous brown with some obscure dark cinnamon spots on the scapulars; remiges greyish cinnamon-rufous, tipped with impure white, subterminally crossed with blackish, under-parts streaked with brown and fulvous or white as in the young (Manado tua Id., May, 1894: Nat. Coll. — C 13356).

Measurements (4 adults: N. Celebes). Wing 287—305 mm; tail 105—111; tarsus 80—85; mid. toe and claw 78—83; exposed culmen 70—73 mm.

Eggs. 4 in number; pale bluish green: 50—55 × 37—40 mm (Australia; North *26*, who gives a figure of the egg). Pale blue: 50 × 36 mm (Australia: Nehrkorn MS.).

Nest. "A loose structure of a few sticks placed crosswise over forks on the branches of trees overhanging creeks, etc.; . . . taken by Mr. Alex. Morton from some low bushes on Schrapper Island, near Port Stephens" (E. P. Ramsay *26*).

Distribution. From Australia and Tasmania to New Zealand, New Caledonia and New Guinea, west through Papuasia and the Moluccas to Celebes, Sangi Islands, North Borneo, Timor and the Keeling Islands.

For exact localities cf. Salvadori *12*, *31*, adding Lord Howe's Island (Ramsay *17*), Dana Id. near Timor (Gazelle Exp. *27*), Great Sangi (Platen *24*), Djampea (Everett *38*), Banggai (Nat. Coll. *37*), and cancelling the New Hebrides.

The Nankeen Night Heron seems to be a fairly common species in Celebes, where the first specimens of which there is any record were apparently obtained by Salomon Müller at Macassar in 1828. For this bird seems to be "the Blue Night Heron" of which he says that it "sometimes flies around in the night, making a loud rattling cry, which is often to be heard at midnight, and so gives rise amongst the half barbarous people of these warm countries to all sorts of sayings and omens, just as is the case among the poor and ignorant in our part of the world" *(d 1)*. The next record of its occurrence in South Celebes was made by Prof. Wilh. Blasius *(20)*, a young female specimen having been obtained by Dr. C. Platen at Kalibangkere, 15. June, 1878, the label of which bore the tragic notice by the traveller: "Last bird of my admirable hunter Rapung, who was murdered and robbed on the following morning". Then it was collected by Prof. Weber at Tempe and Maros. Meanwhile the bird had been obtained in the North Peninsula by Forsten, Rosenberg, Meyer, Musschenbroek, and others, both in the Minahassa and the Gorontalo District. Rosenberg says he got 18 specimens at Lake Limbotto in two (separate) months' collecting in 1863—1864. As Walden first remarked on a young specimen from Meyer, the occurrence of birds in young plumage shows that the species breeds in the island (North Celebes), and W. Blasius points out that Platen's specimen proves this to be the case in the Southern Peninsula also.

A slightly differentiated form of *N. caledonica* is found in *N. crassirostris* Vig. of the Bonin Islands, which has, according to Seebohm *(30)* a stouter bill (22.8—25.4 mm across the nostrils as against 20.3—22.8 in the present bird). Dr. Sharpe distinguishes the two birds as subspecies. Another closely allied form is *Nycticorax manilensis*, with the entire fore-neck, and sometimes the chin and throat, of a rufous colour, the three crest-feathers tipped with black, sometimes entirely black, and the upper parts of a darker hue than in *N. caledonicus*. Both occur in N. Celebes, where it seems very likely that they interbreed. *N. griseus* is easily recognised by its back and scapulars of black glossed with green, grey wings and light grey face and under parts.

In habits, according to Gould, *N. caledonicus* is nocturnal, and it feeds on fishes, water-lizards, crabs, frogs, leeches, insects.

358. NYCTICORAX MANILENSIS Vig.

Philippine Night Heron.

Nycticorax manillensis *(1)* Vigors, P. Z. S. 1831, 98; *(II)* Fraser, Zool. Typ. Av. 1848, t. 64; *(3)* Gray, List Grallae Br. Mus. 1844, 86; *(4)* id., Gen. B. III, 558 (1847); *(V)* Rchb., Orn., Grallat. 1846, t. 155, f. 2391; *(6)* Bp., Consp. 1855, II, 140; *(7)* Swinh., Ibis 1860, 65, 358; *(8)* Hartl. & Finsch, P. Z. S. 1872, 105; *(9)* Finsch, J. Mus. Godef. 1875, VIII, 33; *(10)* Wald., Tr. Z. S. 1875, IX, 238; *(11)* Rchw., J. f. O. 1877, 238; *(12)* Tweedd., P. Z. S. 1877, 769; *(13)* id., ib. 1878, 288, 345; *(14)* id.,

ib. 1879, 73; *(15)* Finsch, ib. 1880, 577; *(16)* Schmeltz, Eth. Abth. Mus. Godef. 1881, 353; *(17)* Tweedd., Orn. Works 1881, 199, 400, 542, 602, 651; *(18)* W. Rams., op. cit. 660; *(19)* Salvad., Orn. Pap. 1882, III, 375; *(20)* Stejn., Pr. U. S. Nat. Mus. 1887, X, 297; *(21)* Grant, P. Z. S. 1888, 203; *(22)* Everett, J. Str. Br. R. A. S. 1889, 190; *(23)* W. Blas., J. f. O. 1890, 146; *(24)* Steere, List Coll. B. & M. Philipp. 1890, 27; *(25)* Wiglesw., Av. Polyn. 1892, 69 (syn. emend.); *(26)* M. & Wg., J. f. O. 1894, 116; *(27)* Sharpe, Ibis 1894, 541; *(28)* Bns. & Worces., B. Menage Exped. 1894, 32; *(29)* Grant, Ibis 1895, 117, 266; *(30)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 19; *(31)* iid., ib. 1896, Nr. 1, p. 6, note; *(32)* Sharpe, Cat. B. 1898, XXVI, 162.

a. **Calherodius manillensis** *(1)* Bp., C. R. 1850, XL, 723, Nr. 133.

b. **Ardea manillensis** *(1)* Schl. (nec Meyen), Mus. P.-B., Ardeae, 1863, 60.

c. **Nycticorax caledonicus** *(1)* Hartl. & Finsch (nec Gm.), P. Z. S. 1868, 117.

d. **Nyctiardea manillensis** *(1)* Gray, HL. 1871, III, 33, Nr. 10173, pt.

e. **Nycticorax minahassae** *(1)* M. & Wg., J. f. O. 1894, 115; *(2)* Sharpe, Cat. B. 1898, XXVI, 163.

Figures and descriptions. Fraser *II*; Reichenbach *V*; Vigors *1*; Bonaparte *6*; Tweeddale *10*, *17*; Sharpe *32*.

Diagnosis. Adult. Like *N. caledonicus*, but the neck all round vinous cinnamon-rufous, with a white dividing mark down the fore-neck; the slate-colour of the head descending about half-way down the hind neck; chin and upper throat white; the three elongated nuchal plumes white with black tips; the cinnamon-rufous of the back washed with purpurescent-slaty, bill black (♂ ad., Kema, 8. Oct. 1893: P. & F. Sar.). — A second specimen is like the above as regards its under-surface, but has the back as well as the hind neck and head above blackish slate-colour, with a tinge of purple on the back; the nuchal plumes (not fully grown) black, in the middle white stained with black; supraloral stripe narrow, vinous rufous; "bill entirely black; iris yellow": P. & F. Sar. (♂, Kema, 1. Aug. 1892: Sarasin Coll. — type of *N. minahassae* M. & Wg.). — A third example almost entirely wants the slaty hue on the back: back vinous cinnamon-rufous; superciliary stripe paler; crest plumes tipped with black; base of lower mandible yellowish (♂ scarcely? adult, strand between Kema and Lilang, Sept. 1894: Sarasin Coll.). — An adult from Cebu differs from these Celebesian examples in having the chin and throat, as well as the entire fore-neck and jugulum, vinous cinnamon-rufous, the entire hind neck blackish slaty like the head (C 4566).

Walden *(10)* describes a nearly adult bird from Cebu as having the chin and throat white (i. e. as in the Celebesian bird described).

Young. The young seems to differ from the young of *N. caledonicus* (see foregoing article) in having the rectrices dark cinnamon-rufous as against grey-brown, and a slaty tinge on the mantle, but we do not think that these differences will hold good for all cases; "bill black, below greenish; bare skin of face yellow-green; iris yellow; feet yellowish grey" (Kema, 8. Aug. 92: Sarasin Coll.).

Measurements (adults).	Wing	Tail	Tarsus	Mid. toe and claw	Exposed culm.
a. (Sarasin Coll.) ♂, Kema, 1. Aug. 92	317	112	78	78	78
b. (Sarasin Coll.) ♂, Kema, 8. Oct. 93	303	105	84	85	72
c. (Sar. Coll.) ♂ vix? ad., Kema — Lilang, Sept. 94	303	107	84	—	81
d. (C 4566) ad., Cebu	313	124	85	84	73

Specimen *b* seems to be in complete plumage; *c* is acquiring new primaries, *a* has the crest-plumes not fully grown out.

Nest and eggs. Undescribed.

Distribution. Philippine Islands — Luzon, Cebu, Leyte, Negros, Malamaui, Catanduanes, Siquijor, Marinduque, Samar, Tablas, Sibuyan, Panay, Masbate, Basilan, Mindanao, Tawi Tawi (Gevers *b 1*, Everett *17*, *18*, Steere *24*, Platen *23*, Bourns & Worcester *28*, Whitehead *29*); N. Borneo (Everett *27*); Labuan (id. *32*); N. Celebes — Minahassa (P. & F. Sarasin *e 1*, *30*); Pelew Islands[1]) (Kubary, etc. *25*); Caroline Islands — Ruk (Kubary *25*).

The Philippine Night Heron was first recorded by us from Celebes after examples from Drs. P. and F. Sarasin, who in 1892 obtained three specimens, two young, and the third an adult male characterised by a blackish slate-coloured back; it was named by us *N. minahassae*. Two more specimens, which the travellers soon afterwards added to their collection, afforded transitions to *Nycticorax manilensis*, consequently we united *(30) minahassae* with that species; at the same time the differences between Celebesian specimens of *Nycticorax caledonicus* and *manilensis* are almost bridged over. While *N. caledonicus* has the fore-neck white, *N. manilensis* has only a white parting down it; also the crest-plumes of *caledonicus* are not tipped with black as in *manilensis*, and the back of the former is of a lighter rufous, wanting a slaty purple tinge on the mantle. Moreover, *N. manilensis* appears to be a variable species, as regards colour, and that independently of age, sex, and season. The type of *N. minahassae* may, perhaps, be correctly termed a melanistic variety of *N. manilensis*. But it is not certain whether the Celebesian birds are quite the same as *N. manilensis* of Luzon, the type of which is said to have the fore-neck rufous (no mention being made of a white parting down it); other descriptions, however, seem to show that the bird is subject to considerable variation in the Philippines, as well as in Celebes. Another possibility is that *N. caledonicus* and *N. manilensis* interbreed in North Celebes, and that we have to do with a mixed race. According to Sharpe *(32)* there is an adult and a young example of *Nycticorax caledonicus* from Celebes in the Tweeddale Collection in the British Museum, but none of *manilensis*.

359. NYCTICORAX GRISEUS (L.).

Common Night Heron.

a. **Ardea nycticorax** *(1)* Linn., S. N. 1766, I, 235; *(II)* Naum., Vög. Deutschl. 1838, IX, 139, t. 225; *(3)* Schl., Mus. P.-B., Ardeae, 1863, 56.

b. **Ardea grisea** [Briss. Orn. 1760, V, 412, pl. 36]; *(1)* Linn., S. N. 1766, I, 239.

c. **Ardea naevia** *(1)* Bodd., Tabl. Pl. Enl. 1783, 56.

d. **Nycticorax europaeus** *(1)* Steph. in Shaw's Gen. Zool. 1819, XI, 609.

e. **Nycticorax nycticorax** *(1)* Boie, Isis 1822, 560; *(2)* Seeb., Ibis 1887, 181; *(3)* Stejn., Pr. U. S. Nat. Mus. 1887, X, 295; *(4)* Seeb., B. Japan 1890, 222; *(5)* Büttik., Zool.

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[1]) *Nycticorax caledonicus*, according to Sharpe.

Erg. Weber's Reise 1893, III, 306; *(6)* Sharpe, Ibis 1894, 426; *(7)* id., Cat. B. 1898, XXVI, 146.

Nycticorax griseus *(1)* Strickl.; *(2)* Gray, List Grallae Br. Mus. 1844, 84; *(3)* Swinh., Ibis 1861, 53; *(4)* id., Ibis 1863, 423; *(5)* Hartl. & Finsch, P. Z. S. 1872, 105; *(6)* Wald., Tr. Z. S. 1872, VIII, 100; *(7)* Salvad., Cat. Ucc. Borneo 1874, 356; *(8)* Rchw., J. f. O. 1877, 237; *(9)* Hume & Davison, Str. F. 1878, VI, 484; *(X)* Dresser, B. Europe VI, 269, pl. 402 (1879); *(11)* Legge, B. Ceylon 1880, 1165; *(12)* Tweedd., Orn. Works 1881, 199, 400, 413, 561; *(13)* Wardl. Rams., op. cit. 660; *(14)* Salvad., Orn. Pap. 1882, III, 376; *(15)* W. Blas., Z. ges. Orn. 1886, 166; *(16)* Cazin, Ann. Sc. Nat. 1887, (4) VII, 177; *(17)* St. John, Ibis 1889, 178; *(18)* Everett, J. Str. Br. R. A. S. 1889, 190; *(19)* Sharpe, Ibis 1890, 148, 285; *(20)* Steere, List Coll. B. & M. Philipp. 1890, 27; *(21)* Hagen, T. Ned. Aard. Genoots. 1890, (2) VII, 167; *(22)* Vorderm., N. T. Ned. Ind. 1891, L, 408; *(23)* Styan, Ibis 1891, 327, 493; *(24)* Salvad., Ann. Mus. Civ. Gen. 1891, (2) XII, 77; *(25)* Wiglesw., Aves Polyn. 1892, 69; *(26)* De La Touche, Ibis 1892, 489; *(27)* Styan, Ibis 1893, 434; *(28)* Hose, t. c. 420; *(29)* Newton, Dict. B. 1893, 420.

f. **Nyctiardea nycticorax** *(1)* Swinh., P. Z. S. 1872, 413; *(2)* David & Oust., Ois. Chine 1877, 444; *(3)* Oates, B. Brit. Burmah 1883, II, 259; *(4)* id., ed. Hume's Nests & Eggs 1890, III, 258.

g. **Nycticorax aegyptius** (Hasselq.); *(1)* Brügg., Abh. Ver. Bremen 1876, V, 98.

h. **Nycticorax griseus naevius** *(1)* Brd., Brew. & Ridgw., Water B. N. Am. 1884, I, 55.

For further synonymy and references cf. Naumann *a II*; Salvadori *6*; Dresser *X*; Stejneger *e 3*; Sharpe *e 7*.

Figures and descriptions. Naumann *a II*; Dresser *X*; Legge *11*; Oates *f 3*; etc., etc.

Adult. Head above, mantle, back, scapulars and innermost remiges black, strongly glossed with green; three or more very long narrow occipital plumes white; neck, a broad superciliary stripe, face, fore neck and under parts, with lower back, rump and upper tail-coverts light grey; wings and tail browner grey; "iris variable — deep red, crimson, scarlet; bill — upper mandible black, loral skin and gape bluish green, base of under mandible greenish yellow, tip black; legs and feet pale orange-yellow, in some yellow" (Legge *10*); wing 280; tail 110; tarsus 73; mid. toe & claw 80; exp. culmen 74 mm (? Java: v. Schierbrand).

Young. Brown, streaked with fulvous, the streaks spreading out into broad terminal spots on the remiges, wing-coverts and back, as in *Nycticorax caledonicus* juv., from which it is not easily distinguished. The greater wing-coverts and remiges are grey-brown with white terminal spots; in *caledonicus* they are dusky brown, vermiculated or barred on the outer web with rufous; the tail is greyer, in *caledonicus* browner; the general tint is greyer than in *caledonicus* (juv. Nr. 11386).

Remark. Perhaps the best means of distinguishing the two forms is found in the proportions of the toe and tarsus: according to our method of measuring the middle toe with claw of *N. griseus* is 5—10 mm longer than the tarsus, in *caledonicus* (as in *manilensis*) the two parts are approximately equal.

Eggs. Of variable shape; in colour delicate pale sea-green, varying to bright light green and greenish white; size 42.7—52.3 × 38—36.8 mm, average of 18 specimens 48.8 × 34.3 mm (Hume *f 4*).

Nest. Of sticks, placed in reed-beds, on trees or bushes, where the birds often breed in very large colonies (cf. Swinhoe *3*, *4*; Hume *f 4*).

Distribution. "The present species is chiefly to be met with in the southern and eastern portions of our continent (Europe), and but seldom occurs in Northern Europe. In

Africa it is found as far south as the Cape of Good Hope; in Asia east to Japan and south to the Malay archipelago; and in America from the Northern United States down to Central America" (Dresser *X*).

In the Oriental Region: — India (Jerdon etc. *11*); Ceylon (Legge *11*); Nicobars (Davison *11*); Burmah (Oates *f 3*); Tenasserim (Davison *9*); China (Swinhoe *3*, *f 1*, David *f 2*, etc.); South Japan (Siebold, Pryer *e 4*); Formosa (Swinhoe *4*); Hainan (Styan *27*); Philippine Is. — Luzon (Meyen *12*, Steere *20*), Mindanao (Everett *12*); Borneo (Croockewit, etc. *7*, *18*); Sumatra (Hagen *21*, Modigliani *24*); Banka (v. d. Bossche *a 3*); Java (Horsfield *7*, Boie *a 3*, Vorderman *22*); Flores (Weber *e 5*); North Celebes — Gorontalo Distr. (Forsten *a 3*, v. Rosenb. *g 1*, Riedel *15*); Caroline Is. — Uap (Kubary *5*); Sandwich Is. (Knudsen *h 1*).

The Common Night Heron is found in most of the warm and temperate countries of the globe, excepting the Moluccas, Papuasia, Australia, New Zealand and Southern Polynesia. Celebes and Flores mark the south-eastern bounds of its range as at present known in the Oriental countries. Only four specimens, as Prof. W. Blasius points out *(15)*, are as yet known from the island — apparently all from the Gorontalo District, probably Lake Limbotto. Mr. Hose *(28)* says that it breeds at Lake Ansok, Borneo, but there is as yet nothing to show whether it is a resident in Celebes or not. Some of the head-quarters of the species seem to be in China and Formosa; a wonderful account of the great breeding colony at the Honam Temple, Canton, is given by Swinhoe *(3)*, and vast numbers were found by him breeding in company in Formosa. Mr. Oates describes a similar condition in Burmah. Their nocturnal habits cause them to be regarded with superstitious fear by the natives, and the trees round the temples have become one of their favourite nesting haunts.

A curious circumstance is related in the "Water Birds of N. America" *(h 1)* showing the persistency with which a first impression reoccurred to and influenced the movements of a tame young Night Heron. The bird had had occasion three or four times to go round a cart and fly half over a heap of rubbish which lay in its path; the heap was then removed, but always afterwards, when the bird had to cross the spot, it did so by "making a circuit around the spot where the cart had formerly stood, and in giving a flying leap over the place where once the pile had previously made this necessary". Such facts should be of interest to students of mental philosophy.

The Common Night Heron is a very distinct species, easily distinguishable from its congeners, *N. caledonicus*, *manilensis* and *crassirostris*, by its glossy green-black head above and back, its dark grey wings and tail, and the light grey of the rest of its person. The young birds of these species are on the other hand hard to discriminate. Small local variations are found in *N. griseus*; the N. American form has been named *naevius*, and that found in the southern countries of S. America, *obscurus*. The last is on an average larger in size *(h 1)*.

GENUS GORSACHIUS Bp.

Differs from *Nycticorax* by its shorter toes, the middle one being considerably shorter than the tarsus, by its smaller and shorter bill, with the nasal groove broader and more membranous in front of the nostril; by the absence of the narrow, elongated nuchal plumes, by its more variegated and Bittern-like coloration. The pectinations on the claw of the middle toe are much larger, and the soles of the feet more expansive. For further particulars see below (p. 849).

Range: India to Japan, the Pelew Islands, Halmahera and Java.

360. GORSACHIUS KUTTERI (Cab.).

Philippine Tiger-bittern.

a. **Ardea limnophylax** *(1)* Schl., Mus. P.-B., Ardeae, 1863, 55, partim; ?*(2)* Rosenb., Malay. Archip. 1878, 278; ? *(3)* W. Blas., J. f. O. 1883, 126.

b. **Gorsachius**[1] **melanolophus** (nec Raffl.); *(1)* Blyth, Ibis 1865, 38 pt. (Philippines); *(2)* Slvd., Cat. Ucc. Borneo 1874, 355, pt.; *(3)* Wald., Tr. Z. S. 1875, IX, 238, pt.; *(4)* Slvd., Orn. Pap. 1882, III, 371, pt.; *(5)* Büttik., Notes Leyd. Mus. 1887, IX, 81, pt.; *(6)* Sharpe, Ibis 1888, 204; *(7)* W. Blas., Ornis 1888, 320; *(8)* Everett, J. Str. Br. R. A. S. 1889, 190; *(9)* Whitehd., Ibis 1890, 60, 147; *(10)* Sharpe, Ibis 1890, 147, 285; *(11)* Steere, List Coll. B. & M. Philipp. 1890, 27; *(12)* Bns. & Worces., B. Menage Exped. 1894, 32; *(13)* Everett, Ibis 1895, 32; *(14)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 9, p. 8; *(15)* Sharpe, Cat. B. 1898, XXVI, 166; *(16)* Grant, Ibis 1897, 250.

c. **Ardea philippensis** *(1)* Martens (nec Gm.), J. f. O. 1866, 28.

d. **Butio kutteri** *(1)* Cab., Orn. Centralbl. 1881, 159; J. f. O. 1881, 425; Rchw. & Schal., t. c. 1882, 115; *(II)* Kutter, t. c. 178, t. III; *(3)* Heine & Rchw., Nomencl. Mus. Heine 1890, 309.

e. **Butio (Goisachius) kutteri** *(1)* Schalow, J. f. O. 1891, 230.

"Tola mariri", adult, and **"Tola ambatja"**, young, Talaut Islands, Nat. Coll.

Figure and description. Cabanis *d 1*; Kutter *d II.*

Adult. Head above and occipital crest blackish slaty; neck dark cinnamon, inclining to raw umber on sides of head; chin white; a stripe of whitish feathers streaked with brown down the fore neck; upper parts slaty brown, the scapulars and wing-coverts mottled and vermiculated with cinnamon, some of the primary coverts chestnut, tipped with white; remiges slaty blackish, broadly tipped with white, with a subterminal blotch of hazel, tail blackish slaty; under parts including under wing coverts white, stained with buff and streaked and spotted irregularly with dark brown, forming bars on the sides, flanks and axillaries; upper part of upper mandible horn-colour, the rest yellowish; legs and feet brown, claw whitish (in the skin), (Esang, Talaut Is., 20. Oct. 1894: Nat. Coll. — C 13854).

Young. Head and nape black, with white terminal edgings and the nuchal plumes with large, subterminal, sagittate spots of white; sides of head, neck and upper parts sooty black, the feathers tipped with white, and with large, irregular, subterminal

[1] The word is variously spelt *Gorsakius*, *Gorsachius*, *Goisakius*, and *Goisachius*. The first is a nomen nudum and *Gorsachius* comes next in chronological order (cf. Stejneger).

spots or (on scapulars and wing-coverts) vermiculate bars of white; some of the inner primary coverts chestnut with broad white tips and a subterminal black portion; remiges blackish slaty, broadly tipped with white; tail-feathers blackish slaty, the lateral ones with imperfect subterminal white narrow bars; under parts buff-white, mottled and spotted with blackish brown, as in the adult (juv. Esang, Talaut, 29. Oct. 94: Nat. Coll. — C 13856).

Transition. A third example is changing from young to adult plumage: general plumage as in the adult, but numerous worn feathers of immaturity (blackish with white sagittate spots or tips) on the sides of the neck, nape, and sides of head; others among the wing-coverts and inner remiges (Esang, 24. Oct. 94: Nat. Coll. — C 13855).

Measurements.	Wing	Tail	Tarsus	Mid. toe and claw	Exposed culmen
a. (C 13854) ad., Talaut (Nat. Coll.)	235	83	60	48	48
b. (C 13855) vix ad., Talaut (Nat. Coll.) . . .	239	88	65	53	51
c. (C 13856) juv., Talaut (Nat. Coll.)	229	82	61	51	49
For comparison: *G. melanolophus*					
d. (C 12415) imm., Java (v. Schierbrand) . .	256	95	67	56	44
e. (C 12414) juv., Java (v. Schierbrand) . . .	254	92	63	53	ca. 44
f. Nicobar Is. ♂ ad.? (Hume *3*)	260	—	58	—	44
g. Nicobar Is. ♀ (Hume *3*)	232	—	58	—	46

Nest and eggs. "The nest was placed among the tangled masses of undergrowth a few feet from the ground, and contained two white eggs, slightly greenish, on 27th June. Axis 1.9, diam. 1.45" = 48 × 37 mm (Palawan: Whitehead *19*).

Distribution. Philippines — Luzon (Kutter *d 1*), Cebu and Masbate (Bourns & Worc. *b 12*), Guimaras and Mindanao (Steere *b 11*), Palawan (Whitehead *b 6*, *b 9*, Plat. *b 7*); North Borneo (Whitehd. *b 10*); Talaut Islands — Karkellang (Nat. Coll. *b 14*); ? North Celebes — Gorontalo (Rosenberg *a 2*).

The genus *Gorsachius* is a form about which it is almost impossible at present to obtain exact knowledge. It consists probably of three or more species or local races found from India and Japan as far as Pelew Islands, Halmahera and Java. Systematically *Gorsachius* seems to have affinities with the Night Herons, *Nycticorax*, but differs by its toes being much shorter than the tarsus, by the more expansive skin on the soles of its feet, by the longer and coarser pectinations of the claw of the middle toe, by its differently shaped bill (the nasal groove being broader and deeper); it lacks the long, narrow, occipital plumes of *Nycticorax*, while the broad white tips to the remiges of *Gorsachius* form a very unusual character in a Heron, except in young birds. It agrees with *Nycticorax* in having the scales on the front of the tarsus for the most part reticulate or irregular, in having 12 tail-feathers as Seebohm first remarked (B. Japan, 225), and by its short neck. The plumage of the young is more Bittern-like than that of *Nycticorax*, and the adult also resembles the Bitterns in the irregular character of the markings on its wings and under surface, but the true *Botaurus* has 10 tail-feathers and very long toes. The New Guinea Bittern, *Zonerodius*, which has 12 tail-feathers, evidently stands nearer to it than *Botaurus*.

For a long time ornithologists were uncertain whether there was one or more species of *Gorsachius*, a matter which Mr. Büttikofer's careful examination *(b 5)* has gone far to clear up. This ornithologist recognises two species: *Gorsachius goisaki* of Japan, also occurring in Formosa and the Pelews, the adult having the crown and occiput rusty red and the bill shorter; and *Gorsachius melanolophus* ranging from India and China to the Philippines, Borneo, Java, the Nicobars and Ceylon, and having a black crest, and a longer, stouter and straighter bill. Both black-crested and red-crested birds have been recorded from Formosa, the Philippines, and apparently Japan, but Mr. Büttikofer remarks that he would believe rather in the occurrence of the two species in the same places than in the identity of *G. goisagi* with *G. melanolophus*. The statement of Legge, that *G. melanolophus* migrates from Malacca to Ceylon and India during the N. E. monsoon (the winter months from October onwards), is not allowed by Büttikofer, who says that it is a winter visitant to the Malay Peninsula and the Sunda Islands, as well as to Ceylon and the Nicobars; the bird is, however, one that is rarely observed in life and is rare in collections, and there seems to be at present no sufficient evidence for drawing conclusions as to its wanderings. On the other hand Mr. Whitehead's discovery of a nest and eggs in Palawan seems to be proof that there are resident birds in the East India Islands. It appears probable, also, that the Archipelago may be visited in winter by others, as Mr. Büttikofer supposes.

Care is required in ascertaining the sex of the birds; according to Hume and Oates, the female has the head rufous or reddish above, and it might, therefore, be mistaken for *goisagi*.

The resident race of Talaut seems to be *Botaurus kutteri* of the Philippines including, according to Heine & Reichenow, Palawan, and we should think, most likely, N. Borneo. In describing it Prof. Cabanis says in effect nothing more than that it has a black head, but is smaller in all its dimensions than *G. melanolophus*. The Talaut birds are longer in the bill and shorter in the wing than those of Java, the under parts are much whiter, the ground-colour in the young Javan bird being cinnamon, inclining to white only about the middle of the feathers, the whole being more copiously streaked, mottled and vermiculated with black; while our rather older Javan example differs more widely in having the fore-neck and breast dark greyish cinnamon-rufous with scanty markings of black.

GENUS BUTORIDES Blyth.

This form has much in common with *Nycticorax*, but is very much smaller (about as large as a Partridge) and the dorsal feathers are lengthened and lanceolate. It differs from the other small Herons of Celebes *(Ardetta)* by having the tarsus reticulated with large scales, by its shorter and stouter legs and feet, and in the adult by the ornamental dorsal feathers.

361. BUTORIDES JAVANICA (Horsf.).

Little Grey Bittern.

The Little Grey Bittern, described first by Horsfield from Java in 1821 (Tr. L. S. XIII, 190), may, apparently, best be treated as a single species of wide range, inhabiting the countries from S. E. Siberia and India to Australia and some of the islands of the Indian and Pacific Oceans, but within this broad area it varies locally to an appreciable degree. The differences are not great, and the northern birds also migrate in winter into some of the quarters of the southern forms, so that it may sometimes be exceedingly difficult to know whether we have to do with a resident example or with a northern visitor. A race of large size inhabits Siberia and Japan, migrating through China down to the Philippines (Palawan — Everett, Ibis 1895, 38) and Labuan, and investigation is almost sure to prove that it goes further; this form was named var. *amurensis* by v. Schrenck. Gould recognised two forms in Australia, which he called *Ardetta macrorhyncha* and *stagnatilis* but the former seems to be simply *stagnatilis* in immature dress. Hodgson called the Indian bird *chloriceps*, Peale that found by him in Tahiti *patruelis*. Dr. Sharpe, who, with the collections of the British Museum, should best be able to form a sound opinion on the matter, recognises (Ibis 1894, 295, 296) four races with the following ranges:

B. javanica: India and Ceylon east to Southern China, and south throughout the Burmese countries to the Malayan Peninsula and the Indo-Malayan Islands as far as Celebes.

B. amurensis (Schrenck), subsp.: Amurland and the Japanese Islands south to Southern China, Formosa, the Philippine Islands and Labuan.

B. spodiogaster Sharpe, subsp.: Andaman and Nicobar Islands.

B. stagnatilis Gld., subsp.: N. & E. Australia to New Guinea and throughout the Moluccas to Timor and Flores, eastwards to the Solomon Group, New Caledonia, the Fiji, Society and Friendly (?) Islands.

So far as we can judge, Sharpe is fully justified in making these subdivisions: *B. amurensis* ordinarily has the wing 10—30 mm longer than in the typical form; *B. stagnatilis* is much more rufous brown on the cheeks, throat and under parts; while *B. spodiogaster* is said to be much darker leaden grey in colour than the typical *javanica*. But, if closer examination be made, there can be little doubt that resident birds will be found to differ in many localities; for instance, the North Celebesian examples before us are not quite identical with the typical form from Java, being more slaty and less green on the crest and upper surface.

The following references bear upon the occurrence of the species in Celebes:

a. **Ardea scapularis** *(1)* S. Müll., Reizen Ind. Archip. 1858, pt. II, 15, 65 (note).

b. **Ardea javanica** *(1)* Schl., Mus. P.-B., Ardeae, 1863, 44; *(2)* Finsch, Neu Guinea 1865, 183; *(3)* Finsch & Hartl., Orn. Centralpol. 1867, 210; *(4)* Brüggem., Abh. Ver. Brem. 1876, V, 97; *(5)* Rosenb., Malay. Archip. 1878, 278.

Butorides javanica *(1)* Walden, Tr. Z. S. 1872, VIII, 100; *(2)* Meyer, Ibis 1879, 143; *(3)* Guillem., P. Z. S. 1885, 561; *(4)* W. Blas., Z. ges. Orn. 1886, 167; *(5)* Büttik., Weber's Reise 1893, III, 284; *(6)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 13; *(7)* Hartert, Nov. Zool. 1896, 181; *(8)* Sharpe, Cat. B. 1898, XXVI, 177.

c. **Ardea stagnatilis** *(1)* Rosenb., Zool. Garten 1881, 167.

"Sweko itam" (Black Heron), Malay (Meyer *2*); **"Rarappera"**, Minahassa (id.).
"Swekko kaki biru", "Swekko abu abu sedang", "Swekko burik ketjil", Minahassa (N. C.).

The following reference apparently proves the occurrence of the migratory E. Asiatic *B. javanica amurensis* in Celebes:

d. **Butorides macrorhyncha** *(1)* W. Blas., Z. ges. Orn. 1886, 169.

For further synonymy of B. javanica and its races cf. Salvadori, Orn. Pap. 1882, III, 359, Agg. 1891, 206; Sharpe, Cat. B. 1898, XXVI, 177.

Adult in breeding plumage. Head above, crest, and a patch on the ear-coverts slaty black, glossed with green; remaining parts grey — dark grey on face and neck, more slate-grey, partly with strong green reflections, on the lanceolate feathers of mantle and scapulars; rump greenish grey, wings and tail-feathers slaty, glossed with green, the wing-coverts and inner remiges edged with buff or white; under parts lighter grey, white along mesial line of throat and metacarpal edge, stained with buff on jugulum (Minahassa, Faber — C 3546). "Iris light yellow; bill above black; bill below, and feet, light green" (Platen, Sarawak: in W. Blas., J. f. O. 1882, 254).

Apparently the lengthened lanceolate plumes of the back and scapulars are a sign of mature age — not simply of nuptial dress, to be lost as soon as the breeding season is over.

Sex. The sexes are not known to differ in plumage.

Immature. Like the adult, but the wing-coverts more broadly margined with buff and cinnamon, the primary coverts and quills conspicuously tipped with white, the lanceolate plumes of the back shorter; neck, face and under-parts grey-brown (near Manado — C 10952).

Young. Without the lanceolate dorsal feathers; head above not black, but blackish, streaked with cinnamon; upper parts bistre-brown, the wing-coverts broadly edged with cinnamon and tipped like the remiges with white or whitish; under parts buff, white on throat, broadly streaked with dusky and brown (Tondano — C 10985).

Measurements.	Wing	Tail	Tarsus	Middle toe and claw	Exposed culmen
a. (C 3545) ad., Minahassa, 1877 (Faber) . . .	180	66	47	51.5	62
b. (C 3546) ad., Minahassa, 1877 (Faber) . . .	182	70	46	49	57
c. (C 13259) vix ad., Minahassa, Feb. 94 (Nat. Coll.)	174	62	45	48	56
d. (C 13258) vix ad., Minahassa, Feb. 94 (iid.) . .	173	57	46	50	62
e. (C 13257) vix ad., Minahassa, Feb. 94 (iid.) . .	171	60	48	52	59
f. (C 10952) vix ad., Minahassa, Aug.-Sept. 92 (iid.)	174	—	45	48	53
g. (C 12097) vix ad., Manado tua, 9. IV. 93 (iid.)	167	60	43	47	57
h. (C 5271) juv., Manado (Musschenbroek) . .	168	58	44	47	60
i. (C 10951) juv., near Manado, Aug.-Sept. 92 (N. C.)	166	—	46	—	56
j. (C 10985) juv., near Manado, Aug.-Sept. 92 (iid.)	168	—	44	—	57
k. (C 13255) juv., Minahassa, Feb. 94 (iid.) . . .	167	59	46	—	56
l. (Sarasin Coll.) ♂ ad., Kema, Sept. 93 . . .	182	66	47	51	60
m. (Sarasin Coll.) ♀ juv., Macassar, 20. IX. 95 .	160	58	44	—	52

Nest and Eggs. In Celebes the bird builds its nest near the water in the reeds (Meyer *2*). "Eggs from the Amur and E. India are dark blue and measure 39 × 28—29 mm" (Nehrkorn MS). Other authors term the tint blue-green, etc.: cf. Hume, Nests and Eggs Ind. B., Oates ed. 1890, III, 249; Taczanowski, Faune Orn. Sib. Orient. 1893, II, 988; North, Nests & Eggs B. Austr. 1889, 322; etc.

Distribution (with racial differences). S. E. Siberia and Japan, south throughout the East India Islands to Australia, New Caledonia, Fiji and Tahiti, Ceylon, the Andamans and Nicobars, Chagos, Mauritius, Rodriguez, Seychelles, Comoros (cf. Salvadori and Sharpe). In the Celebes Province: — Minahassa (Meyer *2*, Fischer *b 4*, etc.), Gorontalo District (Forsten *b 1*, Riedel *4*), Manado tua (Nat. Coll.), small island off Buton (S. Müller *a 1*), Tempe, S. Celebes (Weber *5*), Macassar (P. & F. Sarasin), Saleyer (Everett *7*).

This little Heron seems to be not uncommon in Celebes, though it has not yet been found in the neighbouring island groups, Sangi, Talaut and Sula. The first record of its occurrence in the Province is due to Salomon Müller, who found it on a small island near Buton Island. Meyer observed that it "flies alone. Sits much on a twig over or near the water, bent together, but eagerly looking for food, and suddenly rushing down on a fish or a crab. Also feeds on eggs of fresh-water fishes, especially *Ophiocephalus striatus* (native name 'Kobós'), which is common in the lake of Tondano; but often the strong fish attacks the bird, and hinders it from devouring the eggs" *(2)*.

Rosenberg *(b 5)* describes it and *Ardea macrorhyncha* (the present bird in immature dress?) as also haunting the strand at ebb-tide, where it finds its food among the roots of the mangroves, eating all kinds of marine animals, especially crabs.

B. javanica, which has been placed by many authors among the Little Bitterns *(Ardetta)*, by Seebohm (B. Japan 1890, 224) among the Night Herons, *(Nycticorax)*, is the type of the genus *Butorides*. Dr. Sharpe recognises five or six species, these being spread over most of the temperate and tropical parts of the globe, except of Europe and Western Asia. Its affinities are more with the Night Herons than with the Little Bitterns; its black pileum and crest, and reticulate-scaled tarsus display its relationship to the Night Herons; it differs by the feathers of the back and scapulars elongated and lanceolate, much as in *Ardea*, and in wanting the three long, white nuchal plumes. Its somewhat short and stout legs, toes, and claws appear well adapted for poking about among the rough places of the sea-strand, as is the case with *Demiegretta*, and herein it differs from the Little Bitterns, *Ardetta*, which have more delicate toes, longer, thinner and straighter claws, and the tarsus clad with regular transverse scales.

As is indicated above, two forms of *B. javanica* occur in Celebes, a resident race and a larger bird, of which a young specimen has been recorded from Gorontalo by Prof. W. Blasius and identified by him with the Australian *B. macrorhyncha* (Gld.), but which may more probably be an individual of the large race from S. E. Siberia and Japan, which migrates south in winter (Seebohm, B. Japan 1890, 224; Everett, Ibis 1895, 38; Styan, Ibis 1891, 327, 493; De La Touche, Ibis 1892, 489; David & Oust., Ois. Chine 1877, 442).

GENUS ARDETTA G. R. Gray.

The Little Bitterns are about the size of a Turtle Dove. The bill is long and slender, slightly serrated; the tail short, about as long as the tarsus and consists of 10 feathers; the toes and claws slender; the tarsus covered with transverse shields in front and behind, or covered behind with large polygonal scales. No ornamental dorsal plumes. The scaling of the tarsus and the small tail of 10 feathers serve to distinguish them from *Butorides*. Their nearer affinities are with *Botaurus*, which differs in the characters pointed out below (p. 856).

362. ARDETTA SINENSIS (Gm.).

Little Yellow Bittern.

a. **Ardea sinensis** *(1)* Gm., S. N. 1788, I, 642 (ex Latham); *(II)* Gray & Hardwicke, Ill. Ind. Zool. 1830—34, I, pl. 66, f. 2; *(3)* Schlegel, Mus. P.-B., Ardeae, 1863, 40; *(4)* Brügg., Abh. Ver. Bremen 1876, V, 97; *(5)* Rosenb., Malay. Archip. 1878, 278.

b. **Ardea lepida** *(1)* Horsf., Tr. L. S. 1821, XIII, 190; *(2)* Rosenb., Zool. Garten 1881, 167.

Ardetta sinensis *(1)* Gray, List Grallae Br. Mus. 1844, 83; *(2)* Wald., Tr. Z. S. 1872, VIII, 99; *(3)* Meyer, J. f. O. 1873, 405; *(4)* Salvadori, Cat. Ucc. Borneo 1874, 354; *(5)* David & Oust., Ois. Chine 1877, 448; *(6)* Hume & Davis., Str. F. 1878, VI, 484; *(7)* Legge, B. Ceylon 1880, 1156; *(8)* Salvadori, Orn. Pap. 1882, III, 363; *(9)* Kelham, Ibis 1882, 196; *(10)* W. Blas., J. f. O. 1883, 140; *(11)* Oates, B. Br. Burmah 1883, II, 257; *(12)* Guillem., P. Z. S. 1885, 274, 561, 665; *(13)* Vorderm., N. T. Ned. Ind. 1885, XLIV, 238; *(14)* Salvad., Ann. Mus. Civ. Gen. 1886, (2) IV, 563; *(15)* Stejn., Pr. U. S. Nat. Mus. 1887, X, 289; *(16)* Everett, J. Str. Br. R. A. S. 1889, 190; *(17)* Sh. & Whitehd., Ibis 1890, 148; *(17bis)* Heine & Rchnw., Nom. Mus. Hein. 1890, 308; *(18)* Oates, ed. Hume's Nests & Eggs 1891, III, 255; *(19)* Salvad., Orn. Pap. Agg. 1891, 206; *(20)* id., Ann. Mus. Civ. Gen. 1891, (2) XII, 77; *(21)* Styan, Ibis 1891, 329, 492; *(22)* Wiglesworth, Av. Polyn. 1892, 68; *(23)* De La Touche, Ibis 1892, 489; *(24)* Tacz., Faun. Orn. Sib. Orient. 1893, II, 988; *(25)* Sharpe, Ibis 1894, 258, 425; *(26)* Bns. & Worces., B. & M. Menage Exped. 1894, 32; *(27)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 19; *(28)* Sharpe, Cat. B. 1898, XXVI, 227.

c. **Ardeola sinensis** *(1)* Bp., Consp. Av. 1855, II, 133; *(2)* Oust., Bull. S. Philom. 1878, 187.

d. **Botaurus sinensis** *(1)* Rchnw., J. f. O. 1877, 244; *(2)* Seebohm, B. Japan 1890, 227.

"Swekko burik ketjil", Malay, Tondano, Nat. Coll.

"Pokok werreng okie", Tondano, iid.

For further synonymy and references cf. Oustalet *c 2*; Salvadori *8, 19*; Sharpe *28*.

Figure and descriptions. Gray & Hardwicke *a II*; Legge *7*; Salvadori *8*; Oates *11*; Vorderman *13*; Stejneger *15*; Taczanowski *24*; Sharpe *28*.

Adult. [♂] Head above black, the feathers of forehead edged with brown, those of nape lengthy; upper parts isabelline-olive, chestnut on lower hind neck and shoulders, more drab-brown on scapulars, deep buff on wing-coverts; primary-coverts, remiges and tail-feathers black; upper tail-coverts slaty; under surface buff, with a pink tint on breast, face and ear-coverts; throat, under wing-coverts, axillaries, and longest under tail-coverts white; lateral pectoral feathers with broad blackish brown centres (ad., C 10984, Aug.—Sept. 92: Tondano neighbourhood — Nat. Coll.).

"Irides yellow; legs and beak pale yellowish green, the latter dusky on its ridge" (Kelham *9*).

Female. The female has the black of the head restricted to the middle of the crown and nape, the sides of crown pale chestnut and the feathers of forehead broadly edged with the same; a plait-stripe of pale rufous down the middle of the throat; wing-coverts less clear buff (♀, Tomohon, 22. IV. 94: Sarasin Coll.).

Young. Differs from the adult in having the feathers of head above chestnut-red with blackish centre-streaks, those of back dark brown with tawny-buff edgings; wing-coverts buff with dark centre-streaks; under parts streaked with brown, on throat and breast with orange-rufous (Tondano, Aug.—Sept. 1892 — C 10982).

Measurements (6 adults from Celebes). Wing 125—136 mm; tail 41—46; tarsus c. 46; middle toe with claw c. 47—50; exposed culmen c. 49—53.

Eggs. "East Indian eggs are faint blue, and measure 29 × 24 mm" (Nehrkorn MS.). See, also, Hume *18*.

Nest. In a tussock of grass, or bunch of reeds, or platform of rushes (Doig *18*).

Distribution. Askold Id., S. E. Siberia (Jankowski *24*); Japan (Blakiston & Pryer *d 2*); Marianne Is. (Quoy & Gaimard *22*); Pelew and Caroline Is. (Kubary *22*); China (Swinhoe *8*, David *5*, etc.); Formosa (Swinhoe *8*); Cochin China (Germain *c 2*); India (Blyth, etc. *7*, *8*, *18*); Ceylon (Legge, etc. *7*); Andamans and Nicobars (Hume, Str. F. II, 311); Burmah (Oates *11*); Tenasserim (Davison *6*); Perak and Singapore (Kelham *9*); Sumatra (Davison *7*, Modigliani *20*); Nias (Modigliani *14*); Java (Horsfield *8*, Vorderman *13*); Borneo (Schwaner, Everett *16*); Philippines (Leschenault *8*, Bourns & Worcester *26*); Sooloo (Guillem. *12*); N. Celebes: — Minahassa (Fischer *a 4*, Faber in Dresd. Mus., etc.), Gorontalo (Meyer *3* in Dresd. Mus., Rosenberg *b 2*, etc.); Flores (Wallace *8*); Timor (fide Heine & Reichenow *17bis*); Moluccas — Ternate (Rosenb. *8*); Amboina (Beccari *8*); Ceram (Wallace *28*); New Britain (Finsch *8* ; Australia (Brit. Mus., Cockerell *25*, *28*); Seychelles (E. Newton, Lantz *c 2*).

Specimens of the Little Yellow Bittern from Celebes are somewhat rare in collections, perhaps rather on account of the difficulty of shooting it among the scrub and reeds of its marshy haunts than by reason of its actual scarcity in the island. So far it has been recorded only from (or near) the two large lakes of the Northern Peninsula, Tondano and Limbotto. There is reason to suppose that it breeds there, as it has been killed in summer, viz. at Limbotto in July by Meyer, at Tondano in August or September by our native collectors. But in China the bird is only a summer visitor, and it is probable that in its winter migrations it may reach Celebes. It has been found on such far distant islands as the Seychelles in the Indian Ocean, and the Mariannes and Carolines in the Pacific, a result most likely due to straggling during its migrations.

Ardetta sinensis has its strongest affinities with the Little Bittern of Europe and Western Asia, *A. minuta*, and the latter's geographical representatives, *A. pusilla* (V.) of Australia and New Zealand, *A. podicipes* Bp. of S. Africa and Madagascar, *A. exilis* (Gm.) of N. America, and *A. erythromelas* (V.) of S. America; but these forms differ from it conspicuously in having the back black. *Ardetta cinnamomea* and *A. eurythma*, which occur in Celebes with the present species, may be distinguished from it at all ages by their having the first joint of the

middle toe as long or longer than the second joint, whereas in *A. sinensis* the first joint is very short, being only about two-thirds the length of the second joint. *A. sinensis* has been seen by Legge to perch on a perpendicular reed-stalk, in exactly the same manner as an ordinary Passerine bird.

Dr. Sharpe recognises 9 species of the genus *Ardetta (25)*. In the "Water Birds of N. America" (I, 71) the author of the article *Ardetta* remarks that he can find no difference in form or proportions between *Botaurus* and *Ardetta*. Prof. Reichenow *(d 1)* points out that the plumage sits more smoothly in *Ardetta* than in the true Bittern; neither have any decorative plumes, and they agree in having the inner toe longer than the outer, and 10 tail-feathers. A few differences might have been mentioned: the tarsus of the Common Bittern, *Botaurus stellaris*, is covered behind with small reticulate scales, in *Ardetta* it is scutellated, though somewhat irregularly; the legs of *Botaurus* are shorter, but particularly the bill, when compared with the wing-length, the wing of the Common Bittern being nearly 5 times the length of the exposed culmen, while in *Ardetta* it is about 3 times this length. The plumage of the Common Bittern is "broken up" in pattern as if for concealment and has the soft glossless character of a nocturnal bird, that of typical *Ardetta* is of a diurnal type, as seen in the defined pattern of coloration, and its brighter, closer fitting dress.

363. ARDETTA EURHYTHMA Swinh.

Schrenck's Little Bittern.

Plate XLV.

a. **Ardea (Ardeola) cinnamomea** *(1)* Schrenck (nec Gm.), Reis. Amurlande 1858, II, 447, t. XIII, f. 3 (juv.).

Ardetta eurhythma *(1)* Swinhoe, Ibis 1873, 73; *(2)* id., Ibis 1875, 132, 455; *(3)* id., Ibis 1876, 335; *(4)* Blak. & Pryer, Ibis 1878, 223; *(5)* iid., Tr. As. Soc. Jap. 1880, VIII, 199; *(6)* Sharpe, Ibis 1879, 271; *(7)* Bolau, J. f. O. 1881, 62; *(8)* Blak. & Pryer, Tr. As. Soc. Jap. 1882, X, 118; *(9)* Blak., Amend. List B. Jap. 1884, 12; *(10)* Stejn., Pr. U. S. Nat. Mus. 1887, X, 291; *(11)* Dörries, J. f. O. 1888, 91; *(12)* De La Touche, Ibis 1892, 489.

b. **Ardetta eurythma** *(1)* Swinh., Ibis 1873, 74, pl. II; *(2)* Cab., J. f. O. 1874, 325 (note); *(3)* Tacz., J. f. O. 1875, 256; *(4)* id., Bull. Soc. Zool. Fr. 1876, 259; *(V)* David & Oust., Ois. Chine 1877, 447, pl. 119; *(6)* Tacz., Bull. Soc. Zool. Fr. 1878, 140; *(7)* id., J. f. O. 1881, 188; *(8)* id., Bull. Soc. Zool. Fr. 1885, 476; *(9)* Everett, J. Str. Br. R. A. S. 1889, 190; *(10)* Styan, Ibis 1891, 327, 493; *(11)* Tacz., Faun. Orn. Sib. Orient. 1893, II, 989; *(12)* Sharpe, Ibis 1894, 426; *(13)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 19; *(14)* iid., ib. 1896, Nr. 1, p. 6.

c. **Ardetta sinensis** *(1)* Tacz. (nec Gm.), J. f. O. 1874, 325.

d. **Botaurus eurhythmus** *(1)* Rchnw., J. f. O. 1877, 245; *(2)* Seeb., B. Japan 1890, 227.

e. **Ardetta riedeli** *(1)* Meyer & Wiglesw., Abh. Mus. Dresd. 1894—95, Nr. 4, p. 2; *(2)* Sharpe, Bull. B. O. C. 1895, XXXI, 5; Ibis 1896, 256.

f. **Nannocnus eurythma** *(1)* Sharpe, Bull. B. O. C. 1895, XXXI, 5; Ibis 1896, 256; *(2)* id., Cat. B. 1898, XXVI, 242.

"Swekko burik ketjil" (a name of *B. javanica* and *A. sinensis*), Minahassa, Nat. Coll.

Figures and descriptions. Schrenck *a I*; Swinhoe *b I*; David and Oustalet *b V*; Taczanowski *b 11*; M. & Wg. *e 1*.

Adult male. Above glossy deep bay, black on forehead and middle of crown, passing into chestnut on sides of head, below eye, ear-coverts, sides of and hind neck, and most of the lesser wing-coverts; middle and greater wing-coverts cinnamon; remiges and primary coverts dusky slate, the latter and some of the secondaries whitish at the tip, innermost quills bay, like back; tail-feathers blackish; submalar region and under surface cinnamon-buff, nearly white on under tail-coverts and axillaries, a plait-stripe of red-brown down middle of throat; lateral pectoral plumes black, broadly edged with tawny-olive or dark cinnamon (♂, Tomohon, 7. X. 94: P. & F. Sarasin).

"Bill blackish brown on culmen, yellowish brown on the rest, darker on sides of upper mandible near tomia, light on sides of lower and on gonys. Cere and bare skins round eye purplish flesh-colour, tinged with green. Iris straw-yellow. Legs and toes grass-green" (Swinhoe *2*).

Female and young male. Differ from the adult male in having the back and scapulars black varied with chestnut and covered with white spots of the size of a grain of rice; wing-coverts chestnut, broadly tipped and laterally spotted with cinnamon (where not exposed, with white); under-parts light rufous-buff, broadly streaked with chestnut and blackish; axillaries white, with slaty centres (♀, type of *A. riedeli*, Kema, 12. Oct. 93: P. & F. Sarasin; Main, 10. Feb. 94: Nat. Coll. — C 13256). "Iris gold-yellow; feet and legs green, feet below yellow; bill above black, at the sides and below greenish yellow" (P. & F. S.). The female is sometimes found in adult male dress, probably when old (Swinhoe *2*). A nearly adult male (apparently moulting) has some white spotted feathers among the scapulars and inner secondaries, and the throat is streaked with dark brown; axillaries grey, edged with white; in other respects it is very like the adult male described (♂, Tomohon, 16. Nov. 94: P. & F. S.).

Measurements.

	Wing	Tail	Tarsus	Mid. toe with claw	Exposed culm.
a. (Sarasin Coll.) ♂ ad., Tomohon, 7. X. 94 . . .	149	40	51	55	53
b. (Sarasin Coll.) ♂ vix ad., Tomohon, 16. XI. 94 .	144	44	47	53	49
c. (Sarasin Coll.) ♀, Kema, 12. X. 93	142	39	47	53	45
d. (C 13256) [♀?], Main, 10. II. 94 (Nat. Coll.) . .	140	40	47	51	47
e. (C 12429) [♀?], Java (v. Schierbrand).	142	41	47	51	47

Eggs. "Short and nearly elliptical, pure white with a slight gloss on the surface; shell translucent white: size of a sitting from the banks of the river Argoun in Dauria: 33×27; 33×27; 33.5×27.3 mm" (Taczanowski *b 11*). Three seem to be the full complement of eggs (Swinhoe *1*).

Distribution. S. E. Siberia (Schrenck *a I*, Dybowski, etc. *b 11*); Japan (Blakiston & Pryer *4*, *d 2*); China (Swinhoe *1*, *2*, Styan *b 10*, De La Touche *12*); Cochin China (fide Sharpe *b 12*); N. Borneo (Treacher *6*, *b 9*); N. Celebes: Minahassa (P. & F. Sarasin, Nat. Coll.); Java (v. Schierbrand).

This Little Bittern was first discovered by v. Schrenck in Amurland, where he obtained a young example which he identified with *A. cinnamomea*. Much of what is known about the bird is from the pen of Swinhoe, who first detected it as new to science and described the remarkable differences of coloration in

the sexes. He also ascertained (so far as was possible) that, though the white-spotted birds as a rule are females and young males, the female sometimes assumes the dress of the adult male; also that the young male pairs when still wearing the spotted plumage. "From the number of adult females I examined there can be no doubt that the immature dress is the full feminine costume; and that an occasional female, probably well advanced in years, should affect the male plumage is a very ordinary circumstance among birds. But what means the adult male in immature dress? I presume that males require two years to acquire their full plumage, and breed in their first year". It appears that the allied *A. cinnamomea* also is not in full dress in its second year. Further observations by Godlewski *(b 11)* tend to prove that it is the male which hatches the eggs.

Schrenck's Bittern is a migratory species, and it is hardly to be doubted that the specimens discovered in Celebes were simply winter visitors to the island, as indeed their dates of capture or killing seem to prove. The first specimen was from the Drs. Sarasin, and it was closely followed by a second from our native hunters. Both were in the white-spotted dress, and we, in ignorance of the great sexual difference in *A. eurhythma*, took it for a new species and described it as *A. riedeli.* A further specimen, a male in fully adult plumage, from the Sarasins soon convinced us of our error; and subsequently a third valuable specimen in transition-plumage was obtained by them.

Dr. Stejneger in his excellent "Review of Japanese Birds" *(10)* makes a subgenus, *Nannocnus*, for this species and *A. cinnamomea*, pointing out that they differ from *Ardetta* in having the lower end of the tibia naked (not feathered nearly to the heel joint), and a relatively shorter tail. It might have been added that there is a considerable difference in the foot, the toes of *Nannocnus* being more slender and longer, the claws shorter, and the proportions of the phalanges different — the first joint of the middle toe half as long again as in *Ardetta*, and the first joint of the inner toe also longer and not crooked. But by their plumage *A. eurhythma* and *A. sinensis* betray a near affinity; the adult male of the former might almost be described as similar to *A. sinensis*, but much more saturate in its colours, or *A. sinensis* as a bleached form of *A. eurhythma.* In plumage *A. eurhythma* and *cinnamomea* differ much more when adult, but they are very similar in their second plumage. On the whole we think ornithologists may be grateful to Dr. Stejneger for not trying to enforce the general recognition and use of his name *Nannocnus* as a generic title, though it has a better right thereto than very many. At the present day the process of genus-making, which bids fair not to cease till each species — we do not speak of geographical races — has a genus for itself, is imposing a severe tax on the brains of ornithologists and defeating its own ends. Even the closest specialists cannot always refer species to their "proper genera", because their "peculiarities" are not peculiar to them, or are intangibly small. There are others who remember

better the characteristics of a genus than the names by which those who first pointed out these peculiarities have sought to secure their recognition; however, the facts are more important than the names. The invention of new generic names is a misfortune to the general ornithologist; he has no idea what the user of them is writing about; if he is modest, he is impressed with the learning of the latter, who holds the field to himself, but that does not help on ornithology much. On the other hand subgeneric titles are often of use and very handy in discussing the characters of a small group within itself, and a specialist on the Little Bitterns will welcome Dr. Stejneger's subgeneric name, *Nannocnus*, as well as his useful work.

364. ARDETTA CINNAMOMEA (Gm.).

Little Cinnamon Bittern.

a. **Cinnamon Heron** *(1)* Lath.. Gen. Syn. 1783, III, 1, 77.

b. **Ardea cinnamomea** *(1)* Gm., S. N. 1788, I, 643; *(2)* Raffl., Tr. L. S. 1822, XIII, 326; *(3)* Wagl., S. A., Gen. Ardea 1827, sp. 39; *(IV)* Gray & Hardwicke, Ill. Ind. Zool. 1832, pl. 66, fig. 1 (juv.); *(5)* Schl., Mus. P.-B., Ardeae, 1863, 40; *(6)* Mart., J. f. O. 1866, 28; *(7)* Brügg., Abh. Ver. Bremen 1876, V, 97; *(8)* Rosenb., Malay. Archip. 1878, 278; *(9)* id., Zool. Garten 1881, 167; *(10)* W. Blas., J. f. O. 1883, 140, 160; *(11)* Vorderman, N. T. Ned. Ind. 1883, XLII, 93.

c. **Ardea nebulosa** *(1)* Horsf., Tr. L. S. 1821, XIII, 190 (imm.).

Ardetta cinnamomea *(1)* Gray, List B. Br. Mus., Grallae 1844, 83; *(2)* Blyth, Cat. B. Mus. A. S. B. 1849, 282; *(3)* Jerd., B. India 1864, III, 755; *(4)* Salvad., Ucc. Borneo 1874, 354; *(5)* Hume, Str. F. 1874, II, 311; *(6)* David & Oust., Ois. Chine 1877, 447; *(7)* Tweedd., P. Z. S. 1877, 703; *(8)* id., ib. 1878, 345; *(9)* Hume & Davis., Str. F. 1878, VI, 483; *(10)* Hume, ib. 1879, VIII, 71; *(11)* Kelham, Ibis 1882, 195; *(12)* Kutter, J. f. O. 1882, 177; *(13)* A. Müll., t. c. 436; *(14)* Oates, B. Br. Burmah 1883, II, 256, *(15)* W. Blas., J. f. O. 1884, 216, 219; *(16)* id., Z. ges. Orn. 1885, 323; *(17)* Salvad., Ann. Mus. Civ. Gen. 1886, (2) IV, 615; *(18)* Büttik., Notes Leyden Mus. 1886, IX, 81; *(19)* Everett, J. Str. Br. R. A. S. 1889, 190; *(20)* Oates ed. Hume's Nests and Eggs 1890, III, 252; *(21)* Steere, List Coll. B. & M. Philipp. 1890, 27; *(22)* Sh. & Whitehd., Ibis 1890, 147; *(23)* Styan, Ibis 1891, 327, 493; *(24)* Hartert, J. f. O. 1891, 302; *(25)* id., Ornis 1891, 123; *(26)* Salvad., Ann. Mus. Civ. Gen. 1891, (2) XII, 77; *(27)* De La Touche, Ibis 1892, 489; *(28)* Büttik., Zool. Erg. Weber's Reise 1893, III, 284; *(29)* Sharpe, Ibis 1894, 426; *(30)* Grant, t. c. 522; *(31)* id., Ibis 1895, 266; *(32)* Bns. & Worces., B. & M. Menage Exped. 1894, 32; *(33)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 19; *(34)* iid., ib. 1896, Nr. 1, p. 15; *(35)* Grant, Ibis 1896, 127; *(36)* Hartert, Nov. Zool. 1896, 164, 598; *(37)* Sharpe, Cat. B. 1898, XXVI, 236.

d. **Ardeola cinnamomea** *(1)* Bp., Consp. 1855, II, 132; *(2)* Meyer, Isis 1884, 57.

e. **Ardea (Ardeola) cinnamomea** *(I)* Schrenck, Reise Amurl. 1858, I, 447 partim, t. XIV.

f. **Botaurus cinnamomeus** *(1)* Rchnw., J. f. O. 1877, 245.

g. **Ardeiralla cinnamomea** *(1)* Legge, B. Ceylon 1880, 1162.

"Dowaja" [Gorontalo], v. Rosenberg *b 8.*

"Swekko kuning ketjil", Malay, Minahassa, Nat. Coll.

"Pokok riri oki", Minahassa, iid.

"Condor tjoka", Tjamba and Maros Distr., Platen *16*.

For further references cf. Salvadori *4*; Oates *14*; Sharpe *37*.

Figures and descriptions. Gray & Hardwicke *b IV*; Schrenck *e I*; Legge *g 1*; Oates *14*; Vorderman *b 11*; W. Blasius *16*; Sharpe *37*.

Adult. Above, including wing- and tail-feathers, cinnamon-rufous, slightly ashy on the head, and with a purplish tinge on back; under-parts, especially throat and under wing, much paler; a dark plait-stripe part-way down middle of throat[1]); lateral pectoral plumes greyer cinnamon with broad blackish centres; "bare skin of face yellow-green; iris gold-yellow; bill above black, below greenish; feet yellow-green" (♀, Kema, 24. July, 1893: P. & F. Sarasin).

Sex. The sexes are similar in coloration. Mr. Oates *(14)* and Dr. Sharpe *(37)* ascribe to the adult female a plumage differing much from that of the male, but we, like Legge *(g 1)*, consider this dress to represent the bird in its second plumage. The following specimen appears to be young in second plumage.

Second plumage. Above dark brown, darkest and uniform on head, slightly notched with pale buff on back, very deeply edged and notched on wing-coverts and innermost remiges; remaining remiges and tail dull cinnamon-rufous; under-parts buff, striped with dark brown, except on under tail-coverts (near Manado, Aug.—Sept. 92: Nat. Coll. — C 10953).

Young in first plumage. Above dark brown, the feathers broadly edged with cinnamon-buff, except on forehead and crown; sides of head and ear-coverts bright cinnamon streaked with dark brown; remiges, except the innermost, cinnamon-rufous; under parts buff, streaked with dark brown, clear and whitish on crissum und under tail-coverts; "iris light yellow; bill above dark brown, below yellowish; feet light green-yellow" (♂, Kalibangkere, S. Celebes, 31. V. 78: Platen — C 5381).

Measurements (5 adults). Wing 141—150 mm; tail 40—46; tarsus 44—49; middle toe with claw 57—60; exposed culmen 50—54.

Eggs. "Eggs in my collection from Assam (19. Aug. 81) and Pegu (1. Sept. 77) are almost pure white, and measure 32—33 × 26—27 mm" (Nehrkorn MS.). See, also, Hume *20*, Legge *g 1*, Kutter *12*, Meyer *d 2*.

Nest. "Of grass and rushes in a clump of grass in the middle of a field, or in a bush growing by the side of a drain, sometimes a few feet above the ground" (Legge *g 1*).

Distribution. India (Jerdon, etc. *4*, *g 1*, *20*); Ceylon (Legge, etc. *g 1*); Nicobars (Hume & Davison *5*); Burmah (Oates *14*); Tenasserim (Davison *9*); China (David *6*, Styan *23*, etc.); Manchuria and Amurland (fide David & Oustalet *6*); Formosa (Swinhoe *4*); Cochin China (Oates *14*); Malacca (Kelham, etc. *11*, *13*); Singapore (Kelham *11*); Sumatra (Raffles *b 2*, Klaesi *18*, etc.); Java (Horsfield *4*, S. Müller *b 5*, Vorderman *b 11*); Lombok (Everett *36*); Borneo (Schwaner *b 5*, Grabowsky, etc. *15*, *19*); Philippine Is. (Ever. *7*, *8*, Steere, etc. *21*, *30*, *31*, *32*, *35*); Celebes: — Gorontalo Distr. (v. Rosenberg *b 8*, *b 9*, Riedel *16*, Meyer in Dresden Mus.), Minahassa (P. & F. Sarasin *33*, Nat. Coll.), S. Celebes (Platen *16*, P. & F. Sarasin *34*, Everett *36*).

The Cinnamon Bittern is a somewhat curiously coloured bird; the cinnamon-rufous of its plumage and the soft silky look thereof recalls the Night Herons of the *N. caledonica*-group, and like them it seems not to be of diurnal habits. Abbé David terms it nocturnal, and Legge remarks that in India it is said to

[1]) Not always present.

feed in the morning and evening, keeping quiet during the day; he has, however, seen it about long before evening. It seems to have its nearest affinities with *Ardetta eurhythma*, the preceding species; when adult *A. cinnamomea* is very different in appearance, but in second plumage they are not so easy to distinguish; the cinnamon-rufous remiges and longer toes of *A. cinnamomea* then afford the best criterion for their separation.

That the Cinnamon Bittern breeds in Celebes is shown by the young bird described above from Dr. Platen; it was killed on May 31st, and looks as if it might have left the nest a fortnight before. Eggs have been described from Java and the Philippines. In China, however, and in the N. W. Provinces of India the bird is known as a seasonal visitant from the observations of David, Styan, De La Touche, and Hume, and it is probable that this movement may be felt as far south as Celebes. So far as is at present known this island and Lombok mark the limits of its range towards the south-east.

GENUS XANTHOCNUS Sharpe.

Structurally very like *Ardetta*, also with 10 tail-feathers, differing chiefly by its larger size, the absence of "epaulets" or tufts of feathers with broad black centres on the sides of the breast, and by the long, loose plumage of the sides of the neck and jugulum.

365. XANTHOCNUS FLAVICOLLIS (Lath.).

Yellow-necked Bittern.

The following references bear upon the occurrence of this species in the Celebesian Province:

a. **Ardea flavicollis** *(1)* Finsch, Neu-Guinea 1865, 183; *(2)* Brügg., Abh. Ver. Bremen 1876, V, 97; *(3)* W. Blas., J. f. O. 1883, 116, 121.

b. **Ardetta flavicollis** *(1)* Rchw., J. f. O. 1877, 218.

c. **Ardeiralla flavicollis** *(1)* Salvad., Orn. Pap. 1882, III, 364; *(2)* Meyer, Isis, Dresden 1884, 6, 57; *(3)* W. Blas., Z. ges. Orn. 1885, 321; *(4)* id., Ornis 1888, 632, 643; *(5)* Bütt., Zool. Erg. Weber's Reise 1893, III, 284; *(6)* M. & Wg., J. f. O. 1894, 253.

d. **Ardeirallus flavicollis** *(1)* Sharpe, Ibis 1894, 427.

Xanthocnus[1] **flavicollis** *(1)* Sharpe, Ibis 1894, 431.

e. **Dupetor flavicollis** *(1)* Sharpe, Cat. B. 1898, XXVI, 247.

"Baletagi", Talaut Is. — Kabruang and Lirung, Nat. Coll. *c 6.*

For further synonymy and references to the species and its races cf. Salvadori *c 1*; Sharpe *e 1.*

Figures and descriptions. Gray & Hardwicke, Ill. Ind. Orn. pl. 66, f. 2 (India); Gould, B. Australia VI, pl. 65 (Australia); Salvadori *c 1* (Papuasia and Moluccas); Legge,

[1] We do not think Dr. Sharpe (Bull. B. O. C. XXXI; Ibis 1896, 256) should have rejected his name *Xanthocnus* for *Dupetor* of Heine (Nomencl. 1890, 308), which is a *nomen nudum* intended as a substitute for *Ardeiralla* Verr.

B. Ceylon 1880, 1159 (Ceylon); W. Blasius *c 3* (♀ Celebes); David & Oustalet, Ois. Chine 1877, 446; Sharpe *e 1*, etc.

Adult. Head, sides of face, ear-coverts, hind neck and upper parts blackish slaty; a narrow white metacarpal edge; under surface greyer slaty; sides of neck buff; fore neck varied with a broad plait of black, slaty, chestnut, buff, and white; elongated jugular plumes slaty grey broadly edged with white (ad., Limbotto, Jan. 1876: v. Musschenbroek — C 5269).

An adult from Talaut has only a slight shade of blue on the back, the under surface paler and browner, and the fore-neck less richly varied, there being no pure chestnut on the feathers (C 13017).

Female. The female has been described from other quarters — Ceylon, Moluccas and Papuasia, and Australia — as having the upper surface brown, but Prof. W. Blasius describes the female from Celebes as having the head above black with a bluish hue, and the back blackish in many places. Probably the old female may come to resemble the male in time, but the dark colour of Prof. Blasius' specimens and the blue-black tint of what seems to be the adult male are most likely peculiarities of a geographical character, perhaps confined to Celebes.

Immature. Differs from the adult in having the fore-neck mostly chestnut, varied with white and a little slaty, the jugular plumes slaty, broadly edged with dull chestnut; back and wing-coverts brown (more slaty on latter) with terminal edges of cinnamon; under parts slaty brown, strongly varied with cinnamon on the abdomen and thighs. This specimen is in process of acquiring a brownish black back (Manado, March, 1871: Meyer — C 2005).

Young. Like the immature bird, but the feathers of the upper parts more broadly tipped with cinnamon, the fore-neck and under parts varied with cinnamon, slaty brown, and white (Talaut — C 13016).

Measurements.	Wing	Tail	Tarsus	Mid. toe with claw	Exposed culmen
a. (C 5269) ad., Limbotto, Jan. 76 (v. Musschenbr.)	211	75	68	76	80
b. (C 2005) imm., Manado, Mch. 71 (Meyer) . .	205	70	70	78	84
c. (C 883) ad., Siao (Meyer)	218	80	60	65	79
d. (C 13017) ad., Kabruang, Nov. 93 (Nat. Coll.)	205	77	65	67	76
e. (C 13015) imm., Salibabu, Oct. 93 (Nat. Coll.)	213	—	63	66	77
f. (C 13016) juv., Salibabu, Oct. 93 (Nat. Coll.)	215	70	63	66	76
g. (C 12416) imm., Java (v. Schierbrand). . .	216	70	68	72	76
h. (C 12417) imm., Java (v. Schierbr.)	185	60	62	68	76
i. (Nr. 11250) ad., Java (v. Schierbr.)	201	70	64	77	80
j. (Nr. 11525) juv., Java (v. Schierbr.)	215	78	64	65	78

Variation. This bird displays great individual variation in the length of its members, especially of the toes.

Eggs. Described by Hume in India as "broad ovals of the usual Heron-type. The ground-colour is white, with a very faint green tinge". Size 42 × 32 mm (Doig in Nests & Eggs Ind. B. Oates ed. 1890, III, 251. Compare also: North, Nests & Eggs B. Austr. 1889, 321, pl. XVIII, f. 4).

Nest. "Of tamarisk twigs, with sometimes a few aquatic weeds on which the eggs are laid; they are generally placed about 5 feet over the water, either in a dense tamarisk bush or thick clump of weeds, and are about 9 inches in diameter, 3 inches thick, and have a very slight depression in which the eggs, always four in number, are laid" (Doig l. c.).

Distribution. In the Celebesian area: Talaut Is. — Kabruang and Salibabu (Nat. Coll.); Sangi Is. — Siao (Meyer *c 2*); Celebes — N. Peninsula (Rosenberg *a 2*, Faber *b 1*, Meyer, v. Musschenbroek, Riedel *c 3*); S. Peninsula (Platen *c 3*, Weber *c 5*).

Dr. Sharpe *(d 1)* gives the following range for *X. flavicollis* — India and Central and Southern China to Ceylon, the Malayan countries, Java, Borneo and Celebes — distinguishing the birds of the Moluccas, Papuasia, and Australia respectively as three species. Count Salvadori includes the latter localities in the range of the single species, *Ardeiralla flavicollis*, describing a second species, *A. melaena*, as occurring with it in Great Sangi and Halmahera.

The Yellow-necked Bittern is a puzzling species to the systematist, as it varies much individually as regards measurements (see above) and apparently also in coloration, moreover racial differences seem to exist. If this is the case — and we can hardly doubt it — it is pretty certain that such differences will occur in almost every locality where the bird is resident. The difficulty is increased by the circumstance that the bird is only a summer visitor to China; in winter it proceeds to other quarters, and one is not sure whether this or that specimen in hand from the Celebesian Province was a resident individual there, or a winter visitor from China. Dr. Platen got a young specimen from South Celebes in July *(c 3)*, so that the species must be regarded as a breeding bird in Celebes.

This is a handsome species, its general coloration recalling in many ways that of the Purple Heron. It has often been placed in the genus *Ardetta*, but its affinities with the Little Bitterns look as if they were distant, though it is not easy to find points of structural difference in skins. The long and broad loose feathers of the jugulum, and the absence of the tufts of feathers with broad black or blackish centres on the sides of the breast below the shoulder, are perhaps the most striking differences between it and *Ardetta*.

366. XANTHOCNUS MELAENUS (Salvad.).

Black Bittern.

a. **Ardetta melaena** *(1)* Salvad., Atti Acc. Torino 1877—78, XIII, 1186.
b. **Ardeiralla melaena** *(1)* Salvad., Orn. Pap. 1882, III, 367; *(2)* Meyer, Isis, Dresden 1884, 6, 57; *(3)* W. Blas., Ornis 1888, 631; *(4)* Salvad., Agg. Orn. Pap. 1891, 207.
c. **Ardeirallus melas** *(1)* Sharpe, Ibis 1894, 427.
d. **Xanthocnus melas** *(1)* Sharpe, Ibis 1894, 431.
e. **Dupetor melas** *(1)* Sharpe, Ibis 1896, 256; *(2)* id., Cat. B. 1898, XXVI, 251.

Adult. Black, slightly slaty; abdomen dusky blackish; bill and feet entirely black. Wing 220 mm; tail 80; tarsus 70; bill 84 (Salvadori *a 1*).

Immature? Dusky brown, paler below, inclining to russet down middle of throat; bill black, under mandible paler; legs and feet dark brown. Wing 212 mm; tail 78; tarsus 62.5; middle toe with claw 67; exposed culmen 79 (Sangi — C 10511).

Young. Feathers of fore-neck slightly margined with brown; feathers of back and abdomen lightly washed with white (Salvadori *a 1*).

Distribution. Great Sangi (Bruijn *a 1*); Halmahera (Bruijn *a 1*, *b 1*); Batchian, Morty and Buru (fide Sharpe *c 1*).

Count Salvadori points out that, while this species resembles *X. flavicollis* in all its dimensions, it differs from that species by its uniform black coloration. He dismisses the supposition that it is a melanotic form, having seen two similar individuals. It is a rare species, and the only examples so far recorded from Sangi are the type, stated by Laglaize to have been obtained by Bruijn's hunters in the Sangi Is, and the specimen in the Dresden Museum labelled Sangi — collector unknown — which we believe to belong to this species. Further confirmation of its occurrence in this island is desirable, also to decide the question whether it may not be only a melanistic form of *X. flavicollis*.

ORDER ANSERES.

In the "Catalogue of Birds (vol. XXVII, 1895) Count Salvadori, following Prof. Huxley, groups the *Phoenicopteri*, *Palamedeae* and *Anseres* in the order *Chenomorphae*. Dr. Gadow (Bronn's Kl. u. Ord. VI, 4, Vög. II, 1893, 144) excludes the *Phoenicopteri*, placing them among the *Ciconiiformes*, and leaves the *Anseres* and *Palamedeae* to form the order *Anseriformes* Mr. Sclater in 1880 regarded the *Palamedeae* as a distinct order, which he places next to the true *Anseres* (Newton, D. B. 820). The *Anseres*, with these two more or less closely allied orders or suborders excluded, embrace the Geese, Swans, Ducks and Mergansers. These are well characterized by the bill, which is more or less broad and flat, the edges with a pectinated fringe or serrated, the tip furnished with a nail; by the short tarsus which is about as long as the middle toe or less; by the toes, the three in front fully webbed, and the hallux, which is often very minute, not connected with the other toes by a web. Among their internal, etc. characters may be mentioned: the desmognathous palate, with the basipterygoid processes placed very far forward, as in the *Galli*; the sternum with two pairs of notches, sometimes forming into fenestrae; "the tongue is large, fleshy, with the margins toothed" (Salvadori, Gadow); the ulna does not exceed the humerus in length, the wing is short and its motion in flight swift and accompanied by a whizzing noise, very different from what is noticed in the Gulls, which resemble the *Anseres* in certain respects. The *Anseres* feed upon vegetable matter, fish, etc. In many genera of the Ducks the male wears a handsome nuptial dress. The eggs are unspotted and numerous, placed in an inartificial nest, often composed in part of the down of the parent bird; the young are covered with down, and capable of running and swimming immediately after issuing from the egg.

FAMILY ANATIDAE.

Description as for the order. Count Salvadori (l. c.) recognises 11 subfamilies, of which 3 are represented in Celebes — the *Plectopterinae* by *Nettopus*, the *Anatinae* by *Dendrocycna*, *Anas*, *Nettion* and *Querquedula*, and the *Fuligulinae* by *Nyroca*.

GENUS NETTOPUS Brandt.

Bill Goose-like, shorter than the head, across the nostrils as high as broad; hind toe small, not lobed; no wing-speculum; size small. Four species, inhabiting the Indian, Australian, and Ethiopian Regions.

367. NETTOPUS PULCHELLUS J.Gd.

Australian Pygmy Goose.

a. **Nettapus pulchellus** *(1)* Gould, P. Z. S. 1841, 89; *(II)* id., B. Austr. VII, pl. 4 (1842); *(III)* Rchb., S. A., Natatores, 1844, t. 96 (LV, Spl. XXIII), figs. 938, 939; *(4)* Gould Hb. B. Austr. 1865, II, 357; *(5)* W. Blas., Z. ges. Orn. 1886, 202, 210; *(6)* Rams., Tab. List 1888, 22, Nr. 661; *(7)* North, Nests and Eggs B. Austr. 1889, 337.

b. **Anserella pulchella** *(1)* Gray, HL. 1871, III, 77, Nr. 10595.

Nettopus pulchellus *(1)* Sclat., P. Z. S. 1880, 505; *(2)* Salvad., Orn. Pap. 1882, III, 384; *(3)* Finsch, Mt. orn. Ver. Wien 1884, VIII, 109; *(4)* Salvad., Agg. Orn. Pap. 1891, 210; *(5)* id., Cat. B. 1895, XXVII, 67.

For further references see Salvadori *2*, *4*, *5*.

Figures and descriptions. Gould *a II*, *1*, *4*; Reichenbach *a III*; Salvadori *2*, *5*.

Adult male. Above glossy bottle-green, the feathers of head above tipped with, and crossed with a subterminal bar of pale brown; a broad collar round neck and throat dark bottle-green; upper tail-coverts vermiculated with white; secondaries partly white, two or three of the middle ones entirely white, forming a white band on the wing; face and ear-coverts white, dusky between the gape and eye; under-parts white, the jugulum, sides of neck and of body crossed with **U**- und **V**-shaped bands of bottle-green and blackish; under wing-coverts and axillaries blackish bottle-green; under tail-coverts blackish, the shorter ones glossy ([♂] ad., Amboina: Riedel — C 7324).

"Irides dark brown; bill dark greenish grey (nib white), under mandible irregularly blotched with a lighter colour; legs and feet blackish brown, with a yellowish white nail" (Gould *a II*).

Female. Wants the green collar of the male, and has the head above uniform dark glossy brown, continuous with a green gloss down the hind neck.

Immature male or male in non-breeding or winter plumage. According to Finsch both sexes are similar. Probably this is when the male is not in nuptial dress or is immature.

Measurements. Wing 170—178; tail c. 75; tarsus 26; middle toe with claw c. 46; exposed culmen c. 35 mm.

Nest and eggs. Gilbert found a nest of this species at Port Essington near the margin of a lake; it was "built up in the long grass about a foot above the water, the bottom of the nest resting on its surface; it was composed of long dry grasses, slightly hol-

lowed for the reception of the eggs: the nest in this instance was destitute of any kind of lining; but one afterwards brought him by the natives was interiorly constructed with feathers and contained six eggs, which are white, one inch and seven-eighths long by one inch and three-eighths broad" (Gould *a 4*, *a 7*).

Distribution. Northern Australia (Gould etc. *a II*, *a 4*, *a 6*, *5*); New Guinea — Southern (D'Albertis *4*, Finsch *3*, Goldie *5*), North-western (Dresden Mus.); Tenimber Islands (H. O. Forbes *4*, *5*); Moluccas — Amboina (Hoedt *2*, Riedel in Dresden Mus.); Celebes — Gorontalo Distr. (Riedel *a 5*).

Only a single specimen of the Australian Pygmy Goose has been recorded from Celebes. It is in the St. Petersburg Museum, where it was found by Prof. W. Blasius, who determined it as a female. But we doubt if any really valid mark of distinction has yet been pointed out between the female and the male when the latter is in winter or immature dress.

This species has its nearest affinities with *Nettapus coromandelianus* (Gm.) which also occurs in Celebes. The male of the latter is easily distinguishable by its having a broad white patch across the primaries, but the secondaries only tipped with white (none of them entirely white as in *N. pulchellus*); it wants the crescentic bars on the sides of the neck and body, and in breeding plumage has the collar placed much lower — viz. across the upper breast like a necklace. The two females may be known by *N. coromandelianus* having the secondaries only tipped with white, the under tail-coverts dull white like the under surface, and by its wanting the dark well-defined crescentic bands on the sides.

368. NETTOPUS COROMANDELIANUS (Gm.).

Indian Pygmy Goose.

a. **Anas coromandeliana** *(1)* Gm., S. N. 1766, I, 522 (ex Latham).

b. **Anas girra** *(I)* J. E. Gray in Hardw., Ill. Ind. Zool. pl. 68 (1832).

c. **Nettapus coromandelianus** *(1)* Gray, List B. Br. Mus. 1844 pt. III, 129; *(II)* Rchb., S. A. Nat., 1845, t. LV (96), figs. 933—35; *(3)* Licht., Nomencl. Av. 1854, 10; *(4)* Schl., Mus. P.-B., Anseres, 1866, 76; *(5)* Rchw., J. f. O. 1877, 218; *(6)* David & Oust., Ois. Chine 1877, 501; *(7)* Hume & Davis., Str. F. 1878, VI, 486; *(8)* Legge, B. Ceylon 1880, 1066; *(9)* Tweedd., Orn. Works 1881, 269, 404, 413; *(10)* Kelham, Ibis 1882, 198; *(11)* W. Blas., J. f. O. 1883, 121, 122; Rchw., l. c. note; *(12)* Vorderm., N. T. Ned. Ind. 1883, XLII, 121; *(13)* Oates, B. Br. Burmah 1883, II, 272; *(14)* W. Blas., J. f. O. 1884, 216, 220; *(15)* id., Z. ges. Orn. 1886, 203; *(16)* Hartert, J. f. O. 1889, 436; *(17)* Everett, J. Str. Br. R. A. S. 1889, 192; *(18)* Oates ed. Hume's Nests and Eggs Ind. B. 1890, III, 280; *(19)* Styan, Ibis 1891, 317, 328, 495; *(20)* De la Touche, Ibis 1892, 491; *(21)* Styan, Ibis 1893, 435.

d. **Nettapus coromandelicus** *(1)* Hume, Str. F. 1874, II, 315.

e. **Nettapus kopschii** *(1)* Swinh., Ann. & Mag. N. H. 1873, (4) XI, 16.

Nettopus coromandelianus *(1)* Blyth, B. Burmah 1875, 165; *(2)* Salvad., Cat. B. 1895, XXVII, 68.

For further synonymy and references cf. Salvadori *2*.

Figures and descriptions. J. E. Gray *b I*; Reichenbach *c II*; Schlegel *c 4*; Legge *c 8*; Vorderman *c 12*; Salvadori *2*; etc.

Adult male in breeding plumage. Head above glossy blackish brown; face, superciliary region, sides of occiput, neck, and under-parts white, mottled with brown at the back of the neck, finely vermiculated with dark brown on the sides of the breast and body; round lower neck and jugulum a glossy black collar; under tail-coverts tipped with glossy brown; upper-parts glossy bottle-green, very finely speckled with pale brown, some violet reflections on the wings; middle part of primaries and tips of secondaries white, tips of primaries brown; longer upper tail-coverts white, vermiculated with brown; tail dark brown; under wing-coverts dusky green (Java: v. Schierbrand — Nr. 10792).

"Irides crimson; legs and feet greenish yellow, tinged with black, webs black" (Kelham *c 10*); bill black.

Female. With no pectoral collar, no brown on the under tail-coverts, and little or no white on the primaries: top of head and back greenish drab, wing-coverts dark green; secondaries tipped with white; forehead, face, neck, and under parts dull white, barred with brown on neck and jugulum, faintly mottled or barred with pale drab on the sides, with brown intermixed on forehead and hind neck, and with a dark stripe through the eye (Java: v. Schierbrand — Nr. 10794).

"Irides dark brown; bill yellowish black" (Kelham *c 10*).

Male in winter. "Similar to the female but always retains the conspicuous white patch on the primaries" (Salvadori *2*).

Young male. "Similar to the female till the first spring" (Oates *c 13*).

Young in down. See Salvadori *2*.

Measurements. Wing (6 specimens) 161—171 mm; tail ca. 70; tarsus 24; middle toe with claw 40; exposed culmen 22.

Eggs. Oval; delicate ivory-white, very smooth; size 39—44.5 × 29.7—35 (Hume *c 18*).

Nest. In holes in trees, in ruins, or a floating nest in the water; said to nest sometimes in chimneys in China (cf. Hume *c 18* and Styan *c 19*).

Distribution. India (Latham, etc. *a 1, c 8, c 18*); Ceylon (Legge etc. *c 8*); Andamans (W. Ramsay & Wimberley *d 1, 2*); Burmah (Oates *c 13*); Tenasserim (Davison *c 7*, Darling *2*); China (David *c 6*, Styan *c 19*), Hainan (Styan *c 21*); Cochin China (St. Pierre *2*); Malay Peninsula (Cantor *2*, Kelham *c 10*); Sumatra *(c 3)*; Java (Reinwardt, etc. *c 4, c 12, 2*); Borneo (Grabowsky *c 14, c 17*, Wallace *2*); Philippine Islands — Luzon (Cuming *c 9*, Maitland-Heriot *2*); Celebes — Minahassa (Faber *c 5, c 11*, British Museum *2*).

An example of the Indian Pygmy Goose, or Goose-teal, as it is more commonly called, was contained in a collection of birds from Celebes presented to the Berlin Museum by von Faber some twenty years ago, and was placed on record by Prof. Reichenow *(c 5)*. In answer to inquiries by Prof. W. Blasius as to the Celebesian origin of this and other skins, Reichenow was able to confirm his former statement *(c 11)*. Recently Count Salvadori has recorded a second specimen from Celebes (Manado, collector unknown) in the British Museum, so that there can be no doubt about the right of the species to be included in the Celebes list. Probably it is only a winter visitant there, perhaps only an occasional one. David *(c 6)* and Styan *(c 19)* say it is a summer visitant to China, and of course these birds proceed somewhere to the south in winter. In Borneo and the Philippines it seems to be of almost as rare occurrence as in Celebes.

This species has its closest affinities with *Nettopus albipennis* Gould of Australia which according to Count Salvadori *(2)* differs only by its larger size and is considered by him as doubtfully distinct. The differences between *N. coromandelianus* and *pulchellus* have been pointed out in our article on the latter species. One other species of the genus *Nettopus* is known — *N. auritus* (Bodd.) of Africa and Madagascar.

The habits of the present bird are interestingly described by Kelham *(c 10)* and by Legge *(c 8)*. It is said to be a very bad walker, and the former observer could not recall a case of having seen it on dry ground. The cry is described as Goose-like.

GENUS DENDROCYCNA Sw.

The Tree Ducks are furnished with a longer hallux than is usual among Ducks, being with the claw $^1/_2$ the length of the tarsus or more; toes long; tarsus about $^5/_7$ the length of the middle toe and claw, covered in front with small reticulate scales; no wing-speculum; exposed culmen slightly shorter than the tarsus; size medium. Sexes alike.

Range: the tropical parts of the World.

369. DENDROCYCNA ARCUATA (Horsf.).

Black-spotted Tree Duck.

a. **Anas arcuata** *(1)* Horsf., Zoöl. Research. in Java 1822, pl. 65; *(2)* Finsch, Neu Guinea 1865, 183.

b. **Dendrocygna arcuata** *(1)* Gld., B. Austr. (1846) VII, pl. 14; *(II)* Diggl., Orn. Austr. (1870) pl. 114, f. 2; *(3)* Salvad., Ucc. Borneo 1874, 362, pt.; *(4)* W. Blas., J. f. O. 1884, 212, 216, 219, 221; *(5)* id., Ztschr. ges. Orn. 1886, 171; ?*(6)* Hagen, T. Ned. Aard. Genoots. 1890, (2) VII, 168; *(7)* Wiglesw., Aves Polyn. 1892, 69; *(8)* Grant, Ibis 1895, 267; *(9)* M. & Wg., Abh. Mus. Dresden 1896, Nr. 1, p. 15; *(10)* Sarasin, Z. G. Erdk. Berlin 1896, XXXI, 15; *(11)* Hartert, Nov. Zool. 1896, 590; *(12)* id., ib. 1897, 166.

c. **Dendrocygna vagans** *(1)* Fraser, Zool. Typ. pl. 68 (1849); *(2)* Schl., Mus. P.-B., Anseres, 1866, 88; *(3)* Finsch & Hartl., Orn. Centralpolyn. 1867, 211; *(4)* Wald., Tr. Z. S. 1872, VIII, 102; *(5)* id., ib. 1875, IX, 242; *(6)* Brügg., Abh. Ver. Bremen 1876, V, 98; *(7)* Tweedd., P. Z. S. 1877, 834; *(7bis)* id., ib. 1878, 346, 712; *(8)* Rosenb., Malay. Archip. 1878, 279; *(9)* Meyer, Ibis 1879, 144; *(10)* W. Rams., Tweedd. Orn. Works Index 1881, 660; *(11)* W. Blasius, J. f. O. 1883, 133; *(12)* Vorderman, N. T. Ned. Ind. 1887, XLVI, 222, 240; *(13)* Rams., Tab. List 1888, 22; *(14)* Steere, List Coll. B. & M. Philipp. Is. 1890, 27; *(15)* Bourns & Worces., B. Menage Exped. 1894, 32.

d. **Dendrocygna gouldi** (Bp.); *(1)* Gld., Hb. B. Austr. 1865, II, 374.

e. **Anas vagans** *(1)* Finsch, Neu Guinea 1865, 183; *(2)* Rosenb., Zool. Garten 1881, 168.

f. **Dendrocycna vagans** *(1)* Sclat., P. Z. S. 1880, 510.

Dendrocycna arcuata *(1)* Salvad., Orn. Pap. 1882, III, 385; *(2)* Meyer, J. f. O. 1892, 265; *(3)* id., Abh. Mus. Dresden 1893, Nr. 3, p. 29; *(4)* Salvad., Cat. B. 1895, XXVII, 153.

"Duwiwi" — name for all ducks (Gorontalo), Rosenberg *c 8*.

For further synonymy and references cf. Salvadori *4*[1]).

Figures and descriptions. Horsfield *a I*; Gould *b I*, *d 1*; Diggles *b II*; Fraser *c I*; Finsch & Hartlaub *c 3*; Salvadori *1*, *4*; etc.

Adult. Head above and a stripe down hind neck brown-black; back and scapulars black, the feathers broadly edged with cinnamon; lower back, rump, tail, and wings black, the lesser and median wing-coverts chestnut; the longer upper tail-coverts buff and black; face, sides of head, neck, and under parts cinnamon, paling almost to white on the throat, upper neck, and under tail-coverts, intensifying to cinnamon-rufous on the body below; neck and breast spotted with black, abdomen and thighs mottled with blackish, feathers of the sides of body and of flanks lengthy and slashed with buff and black; wing below dark brown, the first primary notched on the inner web (Lake of Lino, Minahassa: Meyer — C 857).

"Irides dark brown; bill black; tarsi greenish grey; feet blackish grey" (Gould *d 1*).

Sex. The sexes are similar in coloration.

Measurements.	Wing	Tail	Tarsus	Middle toe with claw	Exposed culmen
a. (C 857) ad., Lake of Lino, May 71 (Meyer) .	205	55	50	68	—
b. (C 856) Lake of Tondano, June 71 (Meyer) .	192	—	48	70	41
c. (Sarasin Coll.) ♂ ad., Lura Lake, 9. VIII. 95	200	50	50	68	42
d. (Nr. 3170) ad., Gorontalo (Riedel)	210	65	—	69	45
e. (Nr. 3169) ad., Gorontalo (Riedel)	204	—	48	69	44
f. (Nr. 3171) ad., Gorontalo (Riedel)	200	—	52	72	43

Eggs and nest. Eggs supposed to belong to this species are described as creamy white in colour, 48 × 38 mm; found in nests built in long grass (small islands at Port Essington: Gould *d 1*).

Distribution. Philippines (Cuming, Jagor, Everett, etc. *c 5*, *c 7*, *c 8*, *c 14*, *c 15*, *4*); Borneo (Grabowsky *b 4*, Vorderman *c 12*); Java (Horsfield *a I*, Wallace *c 2*, Vorderm.); Sumba (fide Salvadori *4*, Doherty *b 11*); Timor (Wallace *1*, *4*); Celebes — Minahassa (Forsten *c 2*, Meyer *c 9*), Gorontalo Distr. (v. Rosenberg *c 2*, Riedel *b 5*), Paguatt, Tomini Gulf (Rosenberg *c 2*), Lura Lake, S. E. Central Celebes (P. & F. S. *b 9*, *b 10*), West Celebes (Doherty *b 12*), Macassar (Wallace *4*); Moluccas —? Amboina (Finsch *a 2*, *e 1*, *1*); New Guinea (D'Albertis *1*, Geisler *3*, etc.); Australia except the South (Gould *b I*, Ramsay *c 13*); New Caledonia (fide Verreaux, Layard *b 7*); Fiji Islands (Rayner, Layard *b 7*).

The Whistling Tree Duck — so called from the continuous whistling-noise it emits when on the wing and from its habit of occasionally perching on trees — is a resident in Celebes, as is proved by the circumstance that Rosenberg got a young one in down at Paguatt in July, 1864. According to Salvadori, there are nine species of the genus *Dendrocycna*, spread over the warmer countries

[1]) It is unfortunate that G. Cuvier has generally been cited as the author of this species. No description of his *D. arcuata* was ever published, and nobody knew whether it was *D. javanica* (Horsf.) or the present bird, and some authorities saddled the name on to the one species, some on to the other. As Count Salvadori now shows, Cuvier evidently did not distinguish the two species at all. Neither did Horsfield distinguish them as species, but by a piece of good luck he described one bird as *D. javanica* and afterwards gave a picture of the other as *D. arcuata*, and the names are now valid for the two birds. But such confusion of the synonymy has resulted, that even Count Salvadori himself has scarcely succeeded in unravelling it perfectly.

of the globe, and of these the present species is most nearly allied to *D. fulva* (Gm.) of the Indian countries, Africa and America, which has no black spots on the neck and breast and the upper tail-coverts buff-white, and to *D. javanica* (Horsf), which ranges from India to Java, and like *D. fulva* has the neck and breast unspotted, but the upper tail-coverts chestnut.

The hallux of *Dendrocycna* is scarcely at all lobated, but furnished with a considerable hooked claw, which doubtless stands in connection with its arboreal habits. Salvadori points out that the lower part of the tarsus in front, being covered with small reticulate scales, and not with transverse scutellae, serves to distinguish *Dendrocycna* from all the *Anatinae*. The name has commonly been spelt *Dendrocygna*, but Sclater *(f 1)* has shown that *Dendrocycna* is correct.

370. DENDROCYCNA GUTTATA Schl.

White-spotted Tree Duck.

a. **Dendrocygna guttulata** "Temm."; *(1)* Wall., P. Z. S. 1863, 36 (descr. null.); "S. Müll. MS." *(2)* Sclat., P. Z. S. 1864, 300; *(3)* Brügg., Abh. Ver. Bremen 1876, V, 464; *(IV)* Salvad., Cat. B. 1895, XXVII, 164, pl. I; *(5)* M. & Wg., Abh. Mus. Dresden 1896, Nr. 2, p. 20.

b. **Dendrocygna guttata** [Forsten MS.]; *(1)* Schl., Mus. P.-B., Anseres, 1866, 85; *(2)* Wald., Tr. Z. S. 1872, VIII, 102; *(3)* Rosenb., Malay. Archip. 1878, 279; *(4)* W. Blas., J. f. O. 1883, 140; *(5)* Sclat., P. Z. S. 1883, 52, 200; *(6)* W. Blas., Z. ges. Orn. 1886, 202; *(7)* id., J. f. O. 1890, 146; *(8)* M. & Wg., J. f. O. 1894, 253.

c. **Dendrocycna guttulata** *(1)* Sclat., P. Z. S. 1880, 509.

d. **Anas guttata** *(1)* Rosenb., Zool. Garten 1881, 167.

Dendrocycna guttata *(1)* Salvad., Ann. Mus. Civ. Gen. 1882, XVIII, 401; *(2)* id., Orn. Pap. 1882, III, 388; *(3)* id., ib. Agg. 1891, 210; *(4)* id., Cat. B. 1895, XXVII, 164.

"Taminga", Kabruang, Talaut, Nat. Coll.

"Manu Lantang", Tonkean, East Celebes, iid.

"Bebetalaga", Main, Minahassa, Malay, iid.

For further synonymy and references see Salvadori *1, 4.*

Figure and descriptions. Salvadori *a IV, 1, 4*; Schlegel *b 1.*

Adult. Head above brown of a burnt umber tint, a stripe down hind neck darker brown; upper parts dark brown, the feathers broadly edged with pale brown; remiges dark brown; lower back and rump blackish with pale tips; upper tail-coverts black, the basal ones conspicuously barred or spotted with white; tail blackish, paler at tip; eyebrow, face and sides of upper neck[1]) greyish brown, mottled with whitish; upper throat whiter, tinged with rufous; loral stripe passing through the eye dark brown; lower neck and under parts yellowish rufous, becoming almost white on the abdomen, the bases of the feathers of the neck and breast white, marked with brown so as to enclose white spots, the spots larger and very conspicuous on the sides of body and on flanks, under tail-coverts barred black and white; wing below dark brown, some of the wing-coverts and ends of the axillaries barred with white (Kabruang, Nov. 1893: Nat. Coll. — C 13019).

[1]) Keuleman's plate in Salvadori's Catalogue shows the grey of the upper neck sharply defined from the rufous of the lower neck, but the transition is more gradual.

Sex. The sexes are not known to differ in coloration. About half of our specimens have the middle of the neck and throat blackish grey, narrowly barred or spotted with whitish — possibly a sexual difference.

"Bill black; tarsi and feet ashy, more or less tinged with reddish; irides brown or chestnut" (D'Albertis *4*).

Young. The young in first plumage have the white spots on the feathers of the flanks whitish, broadly edged with black, and the feathers of the sides and breast with the white spots drawn out into irregular mesial streaks (N. Celebes — C 10421).

Measurements. — Tail: c. 70 mm	Wing	Tarsus	Middle toe with claw	Exposed culmen
a. (C 14495) ad., Tonkean, E. Cel., V.—VIII. 95 (N. C.)	212	47	67	44
b. (C 14496) ad., Tonkean, E. Cel., V.—VIII. 95 (iid.)	218	50	70	45
c. (C 13266) ad., Minahassa, Feb. 94 (iid.)	213	45	68	42
d. (C 13267) ad., Minahassa, Feb. 94 (iid.)	215	51	74	45
e. (C 10420) ad., N. Celebes	210	51	75	43
f. (C 10421) juv., N. Celebes.	210	—	—	41
g. (C 13020) ad., Kabruang, Talaut Is., Nov. 93 (Nat. Coll.)	222	50	73	44
h. (C 13019) ad., Kabruang, Talaut Is., Nov. 93 (iid.) .	223	50	—	46
i. (C 13018) ad., Kabruang, Talaut Is., Nov. 93 (iid.) .	226	48	71	43
j. (C 13022) ad., Kabruang, Talaut Is., Nov. 93 (iid.) .	222	50	72	45
k. (C 13021) ad., Kabruang, Talaut Is., Nov. 93 (iid.) .	218	50	73	46
l. (C 13023) ad., Kabruang, Talaut Is., Nov. 93 (iid.) .	223	51	74	45

Nest and eggs. Recorded from New Guinea. According to Dr. E. P. Ramsay the bird nests in holes in trees. D'Albertis speaks of the eggs as white, the ducklings yellow and black *(1)*.

Distribution. Philippines — Mindanao (Platen *b 7*); Talaut Is. — Kabruang (Nat. Coll.); Celebes — Minahassa (v. Rosenberg *b 1*, Nat. Coll.), Gorontalo Distr. (Rosenberg *b 1*, *d 1*), E. Celebes (Nat. Coll. *a 5*); Moluccas — Buru, Ternate, Batchian, Kelang, Ceram, Amboina, Goram, Ceramlaut (see Salvadori *1*); Papuasia — Timorlaut, Kei, Aru, New Guinea (Salvadori *1*, *3*).

The White-spotted Tree Duck is said by v. Rosenberg, whose remarks relate chiefly to the Gorontalo District, to be very plentiful in Celebes. In two months shooting with his hunters on Lake Limbotto, the traveller obtained 23 examples. It also seems to be plentiful in the Talaut Islands. Here, judging from our measurements, it is a little longer in the wing than in Celebes. The type of *D. guttata* was obtained by Forsten in Celebes. It is curious that it is wanting in most collections from there. Probably it makes a good roast.

The present species may be distinguished from its compatriot in Celebes, *Dendrocycna arcuata*, by its rufous white, not cinnamon-rufous, under surface; by its wanting the black spots on the breast, but having here white ones indistinctly seen through the yellow-rufous of the breast, but showing conspicuously on the sides. By reason of its white spots, it is placed by Schlegel and Salvadori next to *D. arborea* (L.) of the West Indies. The latter is a larger bird, with shorter toes, no white on the upper tail-coverts, with black spots on the wing-coverts, and other differences *(b 1)*.

From its quieter coloration, *D. guttata* might be taken for a simpler type of Tree Duck than its fellow-species, *D. arcuata*; yet, from the circumstance that the flank-feathers of the young of *D. guttata* present the longitudinally striped appearance seen in the other bird as an adult, it is probable that the round white spots of *D. guttata* are a peculiarity of recent origin.

GENUS ANAS L.

In the typical Wild Ducks the culmen is longer than the tarsus and about equal in length to the head, much broader than deep as measured across the nostrils; the tarsus transversely scutellated on its lower part in front, the hallux less than half its length; a broad metallic speculum on the secondaries, the shortest of which are about half the length of the wing, or a little more. Its larger size and relatively larger bill afford the best means of distinction from *Nettion*. The males of some species very different in coloration from the females.

Cosmopolitan.

371. ANAS SUPERCILIOSA Gm.

Australasian Wild Duck.

Anas superciliosa *(1)* Gm., S. N. 1788, I, 537 (ex Latham); *(II)* Gould, B. Austr. 1848, VII, pl. 9; *(III)* Rchb., S. A., Natatores (t. 85) figs. 913—14 (1845), (t. 94) f. 2347 (1850); *(4)* Schl., Mus. P.-B., Anseres, 1866, 42; *(5)* Finsch & Hartl., Orn. Centralpolyn. 1867, 213; *(6)* Salvad., Orn. Pap. 1882, III, 394; *(7)* Meyer, Isis, Dresden 1884, 57; *(7bis)* W. Blas., Z. ges. Orn. 1884, 327; *(8)* Ramsay, Tab. List 1888, 22, 38; *(9)* Buller, B. N. Zeal. 2nd ed. 1888, II, 251; *(10)* North, Nests and Eggs Austr. B. 1889, 341; *(11)* Vorderm., N. T. Ned. Ind. 1890, XLIX, 419; *(12)* Salvad., Agg. Orn. Pap. 1891, 210; *(13)* Meyer, Abh. Mus. Dresden 1891, Nr. 4, p. 17; *(14)* Wiglesw., Aves Polyn. 1892, 70; *(15)* Büttik., Zool. Ergeb. Weber's Reise 1893, III, 306; *(16)* Salvad., Cat. B. 1895, XXVII, 206; *(17)* P.& F. Sarasin, Z. Ges. Erdk. Berlin 1895, XXX, 333; *(18)* M. & Wg., Abh. Mus. Dresden 1896, Nr. 1, p. 15; *(19)* Hart., Nov. Zool. 1896, 598.

"Kiti balang", South Celebes, Platen 7.

For further synonymy and references cf. Salvadori *6*, *12*, *16*.

Figures and descriptions. Gould *II*; Reichenbach *III*; Schlegel *4*; Finsch & Hartl. *5*; Salvadori *6*, *16*; Buller *9*; etc.

Adult. General colour above and below brown, above darker, more sepia brown, below grey-brown, — all the feathers edged with whitish brown or buff, on the secondaries a speculum of metallic green, changing to blue in certain lights, framed on three sides with black, formed by the tips of the greater wing-coverts, the adjacent tertiaries and the tips of the secondaries; head above, loral stripe passing through the eye to the occiput, and a short rictal stripe brown-black, the last stripe breaking up into little brown streaks on the middle of the cheeks and ear-coverts, and passing into the brown-streaked neck; remainder of face, superciliary stripe from forehead to occiput, chin and upper throat clear buff; under wing-coverts and axillaries white.

"Iris brown; bill green-black; feet light brown-yellow" (♂, Maros, Waterfall, S. Celebes, 24. II. 78, Platen — C 5383).

Sex. The sexes are similar in coloration. The black frame enclosing the wing-speculum is perhaps less sharply defined in the female; in this specimen the greater wing-coverts are broadly edged with pale brown, the tertiary adjacent to the speculum edged with olive, the secondaries terminally edged with white, though next the speculum black (♀, Lake Posso, 12. II. 95: P & F. Sarasin).

Measurements (3 adults from Celebes). Wing 240—262 mm; tail 85—95; tarsus 43—45; mid. toe c. 58; exposed culmen 49—51 mm.

A specimen from Java (?) has: wing 260, one from Australia 250 mm.

Count Salvadori says specimens from Timor, the Pelew, Fiji and Samoa Islands are decidedly smaller than those from Australia and New Zealand.

Young in down cf. Buller *9*.

Eggs. "Somewhat paler than those of the common *Anas boscas*, otherwise perfectly similar" (Nehrkorn MS.). Up to 10 in number, dull creamy white, 63.5 × 40.6 mm (Buller *9*).

Nest. Of dry grass, flags, etc., lined with the bird's own down, placed on forks of trees, or cliffs, or in herbage on the ground (Buller *9*, Ramsay *10*).

Distribution. Celebes: — North (in Dresden Mus.), Central (P. & F. Sarasin), South (Platen); ?Sumatra (Vorderm. *11*); Java (Boie, Junghuhn *4*); Lombok (Everett *18*); Sumba (Riedel *6*); Timor (S. Müller *4*, Wallace *6*, *16*); Moluccas — Buru (H. O. Forbes *16*); Papuasia — New Guinea, New Hanover, Solomon Is., Santa Cruz Is. (cf. Salvadori *6*, *12*, *16*); Australia and Tasmania (Gould *II*, Ramsay *8*, etc., *16*); Polynesia — New Caledonia (Verreaux, Layard *14*); Loyalty Islands? (Layard *14*); New Hebrides (Layard *14*); Pelew Is. (Tetens, Kubary *14*); Fiji Is. (Peale, Gräffe, Layard *5*, *14*); Tonga Is. (Peale, etc. *5*, *14*); Samoa Is. (Peale, etc. *5*, *14*); Society Is. (Peale, Wodehouse *5*, *14*); Lord Howe Id. and Norfolk Id. (Ramsay *8*); New Zealand and Chatham Is. (Buller, etc. *9*, *16*).

The two specimens of the Australasian Wild Duck from Celebes in the Dresden Museum and the one in the Sarasin Collection are the only ones as yet on record from the island. The credit of its first discovery there belongs to Dr. Platen, whose collections included the fine male described above, which was killed at the Maros Waterfall in the South. A second specimen is labelled "N. Celebes, 1883"; it was received from a dealer with a piece of the label (probably bearing the collector's name) clipped off — why, we do not know. In 1895 this Duck was found by the Sarasins on their arrival at the southern end of Lake Posso in Central Celebes; they write: "Small flights of two species of Duck, the large *Anas superciliosa* and the small *Anas gibberifrons* were plentiful here; we managed to kill four of them at one shot".

Anas superciliosa is very abundant in New Zealand, where its habits are interestingly described by Sir W. Buller. It is a shy bird, as well it may be, when we read of seven thousand — though not all of this species — being caught by the Maories on one lake in three days; that is, when they had shed their quills and were incapable of flight. Dr. E. P. Ramsay records it from all the great divisions of Australia, and it is known from most of the island-groups of Polynesia. In the Moluccas, curiously enough, it has been recorded only from Buru. It seems to be most nearly related to *Anas luzonica* Fraser

of the Philippines, but that species has the superciliary stripe and face rufous, a narrow white band on the wing, the general plumage without the conspicuous pale edges to the feathers. *Anas obscura* of N. America is a good deal similar in general plumage, but is much larger, has the speculum blue, without the buff superciliary and blackish transocular stripe. Somewhat more remote in degree of resemblance is the female of the common *Anas boscas* (or male after the nuptial moult), but, while the male of *Anas boscas* nearly all the year wears a very handsome and distinct dress, the two sexes of the Australasian Wild Duck are similar at all seasons.

GENUS NETTION Kaup.

Teal are of small size; culmen 1 to 1½ times as long as the tarsus, the nail small; hallux less than half the length of the tarsus; wing-speculum rather broad; secondaries ⅔ the length of the wing. Of cosmopolitan distribution. Sexes of some species dissimilar in coloration, of others not so.

372. NETTION GIBBERIFRONS (S. Müll.).

Wood Teal.

a. **Anas (Mareca) gibberifrons** *(1)* S. Müll., Verh. Natuurk. Comm. 1839—44, 159.

b. **Mareca gibberifrons** *(1)* Gray, Gen. B. III, 614, Nr. 5 (1845); *(2)* Wald., Tr. Z. S. 1872, VIII, 102; *(3)* Meyer, Ibis 1879, 144.

c. **Anas gibbifrons** *(1)* Wall., P. Z. S. 1863, 487.

d. **Anas punctata** *(1)* Gld., Hb. B. Austr. 1865, II, 365, part; *(II)* Newt., P. Z. S. 1871, 649, pt., fig. 2, fig. 4; *(3)* Rchw., J. f. O. 1877, 218; *(4)* W. Blas., ib. 1883, 121; *(5)* Rchw., t. c. 122.

e. **Anas gibberifrons** *(1)* Schl., Mus. P.-B., Anseres, 1866, 58; *(2)* Rosenb., Malay. Archip. 1878, 279; *(3)* Sclat., P. Z. S. 1880, 452, 519, 535; *(4)* Rosenb., Zool. Garten 1881, 167; *(V)* Sclat., P. Z. S. 1882, 452, pl. XXXIII; *(6)* Salvad., Orn. Pap. 1882, III, 398; *(7)* Vorderm., N. T. Ned. Ind. 1882, XLI, 219; *(8)* W. Blas., Ztschr. ges. Orn. 1885, 325; 1886, 171; *(9)* Ramsay, Tab. List 1888, 22, 31; *(10)* Buller, B. N. Zeal. 2nd ed. 1888, II, 261; *(11)* North, Nests & Eggs B. Austr. 1889, 342; *(12)* Wiglesw., Av. Polyn. 1892, 70; *(13)* Büttik., Zool. Erg. Weber's Reise 1893, III, 285, 306; *(14)* P.& F. Sarasin, Z. Ges. Erdk. Berlin 1895, XXX, 333; *(15)* M. & Wg., Abh. Mus. Dresden 1896, Nr. 1, p. 15.

f. **Anas gracilis** *(1)* Buller, Ibis 1869, 41.

Nettion gibberifrons *(1)* Gray, HL. 1871, III, 83, Nr. 10663; *(II)* Salvad., Cat. B. 1895, XXVII, 254, pl. II, fig. 2; *(3)* Hartert, Nov. Zool. 1896, 165, 181; *(4)* Salvad., Ann. Mus. Civ. Gen. 1896, XXXVI, 119; *(5)* Hartert, Nov. Zool. 1896, 590.

g. **Anas castanea** *(1)* Rams. (nec Eyt.), Pr. L. Soc. N. S. W. 1879, III, 115, 301; ib. IV, 102.

h. **Mareca castanea** *(1)* Meyer (nec Eyt.), Verh. z.-b. Ges. Wien 1881, 767.

For further synonymy and references cf. Salvadori *e 6, II.*

Figures and descriptions. Sclater *e V*; Salvadori *e 6, II*; Newton *d 2* (sternum and trachea); Schlegel *e 1*; Vorderman *e 7*; Buller *e 10.*

Adult. Above sepia-brown, with pale brown edges to the feathers; lesser wing-coverts,

lower back and rump almost uniform darker brown, slightly glossy; secondaries velvety black, narrowly tipped with white, the tenth feather metallic green, except at tip, the adjacent part of the next feather similar; the outer 9—11 greater wing-coverts white, except quite at the base, the inner feathers brown, tipped with whitish brown; forehead and face rufous brown, finely streaked with brownish black, becoming on crown and nape almost uniform brownish black; chin and upper throat white with rusty tips to the feathers; remaining under parts cinnamon, bright with brown-black spots (the colour of the middles of the feathers) on the breast, dull, with obscure grey-brown spots for the rest; under tail-coverts blackish, with pale edges; under wing-coverts blackish brown, some of the longer inner ones edged with white; axillaries white (♂, Lake Posso, 12. Feb. 95: P.& F. Sarasin).

Female. Seems to be quite similar to the male, but smaller with a smaller bill. This specimen has the throat buff white, without rusty tips to the feathers (♀ Towuti Lake, 1. March, 1896: P.&F. S.).

Measurements	Wing	Tail	Tarsus	Mid. toe and claw	Exposed culmen
a. (Sar. C.) ♂, S. Centr. Cel., 31. Jan. 95	184	80	34	47	34
b. (Sar. C.) ♂, Lake Posso, 12. Febr. 95	184	77	34	45	37
c. (Sar. C.) ♀, Towuti Lake, 1. Mch. 96	182	81	34	44	35
d. (C 852) Lake of Lino, May 71 (Meyer)	185	80	37	47	—
e. (C 853) Lake of Lino, May 71 (Meyer)	178	—	32	44	34
f. (Nr. 3166) Gorontalo (Riedel) . . .	184	—	34	47	38
Nine specimens after W. Blas. *(e 8)*. .	172—190	77—89	32—36	44—51	34—38.5
g. (Nr. 3165) Java (v. Schierbrand) .	192	—	35	48	34
h. (C 6294) Sumba (Riedel)	180	80	35	45	33
i. (C 6293) ♀, Aru (Riedel)	170	—	34	43	31
j. ♂, New Zealand (fide Buller) . .	203	101	32	32 (!)	38
k. ♀, New Zealand (fide Buller) . .	190	89	—	—	—
For comparison *N. castaneum*					
l. (Nr. 10519) [♂ ad.] Australia . . .	230	110	41	52	42
m. (Nr. 10813) [♂ ad.] Australia . . .	225	—	37	47	41
n. (Nr. 12646) [♀] Australia	209	—	35	47	38
o. (Nr. 10500) [♀] Australia	208	—	—		39

Eggs. Described by Dr. E. P. Ramsay *(e 11)* as from six to ten in number; creamy white; laid in the hollow branches of trees. Size about 48 × 37 mm.

Distribution. With racial differences: Celebes — Minahassa (Forsten *e 1*, Meyer *b 3*), Gorontalo Distr. (Forsten *e 1*, Rosenberg *e 1*, *e 4*, etc.), Paguatt (Forsten *e 1*), Lake Posso, Central Celebes (P.& F. Sarasin *e 14*, *e 15*), Luwu, head of Gulf of Tomini (Weber *e 13*, P.& F. S), South Celebes (S. Müller *e 1*, Platen *e 8*, P.& F. S., Everett *3*); Saleyer Id. (Everett *3*); Java (Vorderman *e 7*, Diard *II*, v. Schierbrand); Sumba (Riedel *h 1*, Doherty *5*); Flores (Wallace *c 1*, *II*, Weber *e 13*); Timor (S. Müller *e 1*, Wallace *c 1*, *II*); Aru (Riedel); New Guinea (Loria *4*); New Caledonia *(e 1, e 12)*; Australia (Gould *d 1*, Ramsay *e 9*); New Zealand (Buller, etc. *e 10*).

Touching the question of the identity of *N. castaneum* and *N. gibberifrons*, or their distinctness as two species, the difficulty may be stated as follows:

brown Teal are plentiful in which the males and females are similar and they are known to breed in this dress, but a male bird often occurs (in Australia, at least) which has a green-black head and neck and chestnut under parts; its female is similar to the brown birds: is it a distinct species, or is the chestnut dress of the male only a phase of plumage?

Gould took the chestnut dress for the nuptial plumage of the old male. He writes: "It is very rare that the male is killed in the nuptial dress, and I am induced to believe that it is not assumed till the bird is two or three years old; after the breeding-season the sexes are alike in plumage, and for at least nine months of the year there is no difference in their outward appearance".

While repeating this remark in his Handbook afterwards issued, he greatly modifies it in effect by an additional remark: "There appear to be two very distinct races of this bird, one of which is much larger than the other; so great in fact is the difference in this respect in specimens from various parts of the country, that the idea presents itself of their being really distinct species. The smaller race inhabits Tasmania, the larger the western and southern portions of Australia".

Dr. E. P. Ramsay was at first under the impression that Australia was inhabited by only one form of this Teal, *N. castaneum*: comparing it with a specimen of *N. gibberifrons* from New Zealand, he points out some differences — the smaller feet and toes and smaller size of the flattened portion of the bill at the base of the forehead of the New Zealand specimen (Pr. L. Soc. N. S. W. 1879, III, 38).

Later (ib. 1886, 2 ser. I, 1151; Tab. List 1888, 22, 31), Dr. Ramsay recognised both species as occurring in Australia, but remarks: "I have not been able to find any good characteristics between the females of this species up to the present time".

In 1871 (P. Z. S. 649), Prof. A Newton stated that the female of *Nettion castaneum* possessed a *bulla ossea* on the lower larynx, like that of the male. Now the *bulla ossea* is known only in the male sex in the Duck family. The supposed female had a free process on the posterior sternum, the male an enclosed fenestra. Dr. Ramsay, however, showed that the female of the bird known to him as *Anas castanea* was without the *bulla ossea*. (Pr. L. Soc. N. S. W. 1879, III, 154).

The Zoological Society of London received 18 living examples of a duck in 1879, which were registered as *Anas punctata (castanea)*. Dr. P. L. Sclater wrote in the following year (P. Z. S. 1880, 452): "Having examples of both sexes we naturally expected that the male would put on in the spring the chestnut breast and full breeding plumage portrayed by Mr. Gould in his figure of that sex. Such, however, has not been the case; little change has occurred except the brightening of the colour; and, as far as I can make out, the birds do not belong to *A. punctata* at all, but to *A. gibberifrons* Müller, a species closely resembling the female of *A. punctata*, which has lately been ascertained to occur

in Australia". These individuals did not breed in 1880 and 1881, though six pairs were established in various parts of the Gardens; but in 1882 a pair nested at the end of March and hatched four young ones. Dr. Sclater adds: "There is no longer any doubt therefore that we have here to deal with a species which, however much it may resemble the female of *Anas castanea*, is quite distinct, and of which the sexes, as may be proved by the examination of our breeding birds, are very nearly alike, the female being merely slightly smaller in size and duller in plumage".

The supposed female of *A. castanea* discussed by Prof. Newton was "in all probability a male of *Anas gibberifrons*".

Count Salvadori recently examined specimens — one in the plumage of the male *N. castaneum*, the other in that of the supposed female of the same, and both on being dissected proved to be males. The *bulla ossea* was present in both. Nevertheless, he remarks of *N. gibberifrons* that it is "absolutely similar to the supposed female of *N. castaneum*, both in colour and dimensions, so that I am utterly unable to distinguish it", and he holds the two species as distinct, evidently not without misgivings.

Our own conclusion in the matter is 1) that *N. gibberifrons* is a species perfectly distinct from *N. castaneum*, as is proved by Dr. Sclater, 2) that there is no sound evidence to show that *N. castaneum* has ever occurred outside of Australia and Tasmania.

Besides Australia, *N. castaneum* has indeed been recorded from New Guinea, New Caledonia, New Zealand, Sumba, Java, and Celebes.

For the indication New Guinea Dr. Ramsay is the authority (Pr. L. Soc. N. S. W. 1879, III, 115, 301; ibid. 1880, IV, 102). The locality was questioned by Salvadori in his "Ornitologia della Papuasia" (1882), and afterwards Dr. Ramsay evidently altered his decision, as in his "Tabulated List of Australian Birds" 1888, 22, he does not include New Guinea in the range of *Anas castanea*, but with a "?" in that of *A. gibberifrons*. New Guinea therefore should be struck out of the range of *N. castaneum* for the present.

New Caledonia was put down as the habitat of an undescribed "*Anas punctata* var." by Gray (P. Z. S. 1859, 166) and by Verreaux and des Murs (Rev. Zool. 1860, 422). Schlegel received one of Verreaux's specimens and determined it as *A. gibberifrons*; and some descriptions of a duck by Jouan (Mém. Soc. Cherb. 1863, IX, 100, 242) included by Salvadori in the synonymy of *N. castaneum* certainly do not relate to the adult male of *N. castaneum*, though they might possibly have been made from the female, or from *N. gibberifrons*. We anticipate therefore that *N. gibberifrons* rather than *N. castaneum* belongs to New Caledonia.

From New Zealand Salvadori records a female of *N. castaneum*, but as he confesses to an inability to distinguish the female of this species from *Nettion gibberifrons* we are justified in considering it an error, since Sir W. Buller makes

no mention of the occurrence there of such a bird as the male *N. castaneum* in his "History of the Birds of New Zealand".

Sumba was recorded for *Mareca punctata (= N. castaneum)* by Meyer (Verh. zool.-bot. Ges. Wien 1881, 767). The specimen certainly is not identical with two males of *N. castaneum* from Australia, being very much smaller, besides being in the female type of dress; it is smaller in the bill (probably therefore a female) and a little greyer than our six specimens of the typical *Nettion gibberifrons* from Celebes, but otherwise we find it to be identical therewith. A specimen from Aru (C 6293: Riedel — a new locality) is similar to the Sumba example.

The locality Java was indicated for *Anas punctata (= castanea)* long ago by Lesson (Tr. d'Orn. 1831, 252). The author of the species was unknown to him; he suggests with a "?" Horsfield, but this may have been due to the locality Java being perhaps indicated on the label, this island having been then recently made known in the ornithological sense by Horsfield's researches. No one versed in the labelling of those days will attach much importance to the locality. On the other hand *N. gibberifrons* has been recorded and described from Java by Dr. Vorderman; there is also an example from Java in the Dresden Museum similar to Celebesian specimens of *N. gibberifrons*, and one in the British Museum.

From Celebes *Anas punctata (= castanea)* was recorded by Prof. Reichenow (J. f. O. 1877, 218; 1883, 122) and this remained the only notice of its having occurred there.[1]) The probability of its having been *N. gibberifrons* has been already suggested by Prof. W. Blasius, and Prof. Reichenow, in answer to an inquiry by ourselves, kindly informs us that "the specimen in question is a female and may therefore belong to *gibberifrons*, if that species is distinct[2]).

Celebesian specimens of *N. gibberifrons* differ from Australian females of *N. castaneum* (if rightly determined) by the small size of the former and the cinnamon tint of the under surface, as compared with the buff whitish of *N. castaneum* — the middles of the feathers being, of course, brown. In New Zealand *N. gibberifrons* is larger than in Celebes, and no one has as yet been able to show how it is to be distinguished from the female of *N. castaneum*. The name *gracilis* was proposed for it by Buller, but afterwards withdrawn[3]).

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[1]) The "*Anas punctata* Tem." of Finsch (Neu Guinea 1865, 183) is placed by Salvadori in the synonymy of *Dendrocycna guttata*, apparently with perfect right.

[2]) Prof. Reichenow suggests that the males in the dress of *gibberifrons* in the Zoological Gardens of London and elsewhere may have been the younger examples of *castaneum*, not yet in full plumage. But the pair which bred in the Regent's Park were at least 3 years old in 1882.

[3]) The extraordinary dissimilarity of the male in breeding plumage of *N. castaneum* promises to afford food for philosophical investigation. At present it appears not improbable that the nuptial plumage was not acquired by a very gradual process, for then we might expect to see lower stages of this dress in the male of *N. gibberifrons*. It really looks as if the male of *N. castaneum* must have come into its nuptial dress all at once, just as under domestication an abnormal individual is sometimes born which "breeds true".

GENUS QUERQUEDULA Steph.

The Garganeys are of small size, and may best be distinguished from *Nettion* by the shape of the wing; the secondaries of *Querquedula* are very short, the shorter ones being considerably less than half the length of the wing, as against two-thirds in *Nettion*. The blue or bluish grey upper wing-coverts of *Querquedula* are, as Salvadori's key shows, also characteristic.

Five species: "Northern Hemisphere and Neotropical Region".

373. QUERQUEDULA CIRCIA (L.).

Garganey.

a. **Anas querquedula** *(1)* Linn., S. N. 1766, I, 203; *(II)* Naum., Vög. Deutschl. XI, 677, t. 303 (1842); *(3)* Schl., Mus. P.-B., Anseres, 1866, 49; *(4)* Rosenb., Malay. Archip. 1878, 279; *(5)* id., Zool. Garten 1881, 167; *(6)* Salvad., Orn. Pap. 1882, III, 400; *(7)* Tacz., Faun. Orn. Sib. Orient. 1893, II, 1145.

b. **Anas circia** *(1)* Linn., S. N. 1766, I, 204; *(2)* Brügg., Abh. Ver. Bremen 1876, V, 464; *(3)* Legge, B. Ceylon 1880, 1080; *(4)* Seeb., B. Japan 1890, 246.

Querquedula circia *(I)* Steph., Gen. Zool. XII, 2, p. 143, pl. 51 (1824); *(2)* Swinh., Ibis 1863, 434; *(III)* Sharpe & Dresser, B. Europe VI, 513, pl. 427 (1871); *(4)* Wald., Tr. Z. S. 1872, VIII, 102; *(5)* Salvad., Cat. Ucc. Borneo 1874, 361; *(6)* David & Oust., Ois. Chine 1877, 502; *(7)* Hume & Davis., Str. F. 1878, VI, 489; *(8)* Prjev., Rowley's Orn. Misc. 1878, III, 103; *(9)* Meyer, Ibis 1879, 144; *(10)* W. Blas., J. f. O. 1883, 140; *(11)* Oates, B. Brit. Burmah 1883, II, 287; *(12)* Vorderm., N. T. Ned. Ind. 1884, XLIV, 253; *(13)* W. Blas., Ztschr. ges. Orn. 1886, 171; *(14)* Vorderm., N. T. Ned. Ind. 1889, XLIX, 419; *(15)* Everett, J. Str. Br. R. A. S. 1889, 192; *(16)* Oates ed. Hume's Nests and Eggs Ind. B. 1890, III, 291; *(17)* Steere, List Coll. B. & M. Philipp. Is. 1890, 27; *(18)* Styan, Ibis 1891, 328, 496; *(19)* De La Touche, Ibis 1892, 492; *(20)* Styan, Ibis 1893, 435; *(21)* Salvad., Cat. B. 1895, XXVII, 293.

c. **Querquedula querquedula** *(1)* Baird, Am. Journ. of Sc. & Arts 1866, XLI, 339; *(2)* Stejn., Bull. U. S. Nat. Mus. 1885, Nr. 29, 156; *(3)* Sharpe, Brit. B. 1896, II, 291.

For further synonymy and references cf. Salvadori *21.*

Figures and descriptions. Naumann *a II*; Sharpe and Dresser *III*; Legge *b 3*; Taczanowski *a 7*; Salvadori *21*; etc., etc.

Winter plumage. Above sepia-brown, the feathers with pale edgings, which are broadest and palest — buff-white — on the upper tail-coverts, and grey on lower back; hind neck almost uniform grey-brown; head above blackish with light brown edges to the feathers; a dark brown streak through the eye; sides of head, face, throat and sides of neck white, finely streaked with brown, except a clear streak on sides of occiput, a spot at base of bill, and chin and upper throat; jugulum and breast rufous buff, with spots and irregular bars of blackish; remaining under-parts white, with indistinct spots and bars, taking the form of large brown spots on the under tail-coverts; upper wing-coverts and adjacent scapulars light grey-blue, the greater series terminally white; secondaries metallic grey-green, tipped with white, primaries where exposed blackish, elsewhere greyish brown, shafts white; tertiaries edged with white; wing below brownish grey, darkest on lesser wing-

coverts; the longer ones, axillaries and base of remiges white (♂? — Lake Limbotto, Jan. 1876: van Musschenbroek — C 5273).

Female. Similar to the specimen described above, but with hardly any gloss on the speculum, jugulum and breast deeper rufous, with dark middles to the feathers on the former region and dusky bars on the breast (♀, Lake Limbotto, July, 1871: Meyer — C 859).

Male in breeding plumage. Differs in having the face, throat and sides of neck brown, with white shaft-streaks; a broad white stripe from above eye to half-way down the hind neck; breast pale raw umber, with U-shaped bars of black, forming into straighter bars on lower breast; chin black; scapulars black, each with a stripe down the middle white or buff (♂, Saxony — Nr. 10505).

Measurements (3 examples from Celebes). Wing 188—193 mm; tail c. 75; tarsus c. 29; middle toe and claw c. 41; exposed culmen 35—38.

Young. The young in down is dark brown above, pale brown below; a buff streak above the eye, a dark streak through it.

Eggs and nest. 8 to 10 eggs, oval, rich creamy yellow: 47.5 × 36.8 mm. The bird nests on the ground, in herbage or rushes, using rushes and dry grass, with its own down for a lining (Sharpe & Dresser *III*).

Distribution. "Palaearctic Region, wintering in Northern Africa as far south as Shoa and Somali-land, in Palestine, India with Ceylon, in Burmah, China, Japan, Philippines, Borneo, Java, Celebes, Ternate and Ceram" (Salvadori *21*). Philippines — (Leyden Mus. *a 3*), Luzon (Steere *17*); N. W. Borneo (Hose *21*), Labuan (Lemprière *15*, Everett *21*); Sumatra (fide Vorderman *14*); Java (S. Müller *a 3*, Vorderman *12*); Celebes — Lake Limbotto (Rosenberg *a 3*, *a 5*, Meyer *9*, Riedel *b 2*, *13*, Faber and v. Musschenbroek in Dresden Mus.), ? Manado (in British Mus.); Ternate (Rosenberg *a 6*); Ceram (Wallace *21*).

The Garganey is, most likely, simply a winter visitor to Celebes, though some individuals remain there during the summer, as is shown by the fact that Meyer got it at Limbotto in July, 1871, while W. Blasius records an example obtained by Riedel in the summer dress of the male. Up to the present the Lake of Limbotto is the only locality in Celebes positively known for this Duck; here it is said by Rosenberg and Meyer to be rather scarce. The nearest part of Asia, where it is known to nest, seems to be S. E. Mongolia; where it was found breeding by Prjevalsky *(8, a 7)*. It has indeed been recorded as breeding in India, but more evidence thereof is wanting *(16)*. In South-east Mongolia it arrives about the middle of April. In South China it is known as a bird of passage; Mr. De La Touche reports it "abundant at Foochow from the end of February to the late spring. They pass again towards the middle of September, but not in such numbers. This Teal also passes Swatow in spring and autumn." It is recorded as a winter visitor to India, Ceylon, Burmah, Japan, by Hume, Legge, Oates, and Seebohm *(16, b 3, 11, b 4)*.

In the Catalogue of the Ducks, Salvadori separates *Querquedula* from *Nettion* somewhat widely, but it is not very easy to point to structural characters wherein the two forms differ. The chief difference seems to lie in the wing: the secondaries of *Querquedula* are shorter than in *Nettion* — about one-third shorter, as measured from the tips of the greater coverts, forming a

narrower speculum; while the primaries of *Querquedula* are narrower and more pointed. Altogether the wing of *Querquedula* is that of a bird of greater flying-powers. The present species is very distinct; its nearest affinities are perhaps with *Q. discors* (L.) of N. America and, in winter, the West Indies and some parts of S. America; the latter has the lesser and middle wing-coverts light blue and, in the male, a white crescentic patch down the face, but no such mark along the sides of the head and nape as in *Q. circia*.

GENUS NYROCA Flem.

This genus may be distinguished from the preceding Celebesian Ducks by its hallux which is lobated as markedly as that of a Grebe. The bill is broad and flat, longer than the tarsus; the outer toe is equal in length to the middle one. Of cosmopolitan distribution.

374. NYROCA FULIGULA (L.).

Tufted Duck.

a. **Anas fuligula** *(1)* Linn., S. N. 1766, I, 207; *(2)* Steere, List Coll B. & M. Philipp. Is. 1890, 27.

b. **Anas cristata** *(1)* Leach (nec Gm.), Syst. Cat. M. & B. Br. Mus. 1816, 39.

Nyroca fuligula *(1)* Flem., Phil. of Zool. II, 260 (1822).

c. **Fuligula cristata** *(1)* Steph., Gen. Zool. XII, 2, 190 (1824); *(2)* Finsch, Journ. Mus. Godef. 1875, VIII, 40; *(III)* Dresser, B. Europe VI, 573, pl. 437 (1879); *(4)* Hume, Str. F. 1879, IX, 115; *(5)* Everett, Ibis 1890, 263; *(6)* Seeb., B. Japan. 1890, 255; *(7)* Styan, Ibis 1891, 328, 497; *(8)* De La Touche, Ibis 1892, 492.

d. **Morillon des Isles Mariannes** *(1)* Less., Tr. d'Orn. 1831, 632 (fide Salvadori).

e. **Fuligula fuligula** *(1)* Licht., Nomencl. Av. 1854, 102; *(2)* Salvad., Cat. B. 1895, XXVII, 363.

f. **Fulix cristata** *(1)* Swinh., P. Z. S. 1871, 419; *(2)* David & Oust., Ois. Chine 1877, 508; *(3)* Tacz., Faun. Orn. Sib. Orient. 1893, II, 1167.

g. **Aythya fuligula** *(1)* Stejn., Bull. U. S. Nat. Mus. 1885, Nr. 29, p. 160.

h. **Nyroca cristata** *(1)* Newt., Dict. B. 1894, 736.

For further synonymy and references cf. Salvadori *e 2*.

Figures and descriptions. The standard works on Birds of the countries of Europe; Dresser *c III*; Taczanowski *f 3*; Salvadori *e 2*; etc.

Adult male. Upper surface, breast and under tail-coverts black; back and scapulars duskier, finely peppered with whitish specks; a long decurved crest; lower breast, sides and abdomen white; thighs dusky; secondaries white, tipped with black; unexposed part of inner primaries whitish (♂, Saxony — Nr. 10454).

"Bill lead-blue, tipped with black; iris yellow; legs dull olive-plumbeous, with blackish webs" (Dresser *III*).

Female. The black parts in the male replaced by brown, darkest on the lower back, more ferruginous on the face and breast, palest on anterior parts of cheeks; scarcely any crest; abdomen and sides with brown intermixed with the white (♀, Pillnitz, Saxony — Nr. 12429).

Changing plumage. Male undergoing the post-nuptial moult, or young assuming the adult male dress. Browner than the adult male; forehead, face and chin blackish; neck pale dull brown (broccoli-brown); upper breast blackish, the feathers terminally edged with white; wing 204 mm; tail ca. 45; tarsus 37; middle toe and claw 59; exposed culmen 39 (Celebes [Gorontalo]: Riedel, 1875 — C 257).

Young [male]. Brown like the female; forehead and face blackish; the white under-parts marked with indistinct bars and streaks; wing 205 mm; exposed culmen 38 (Celebes: Riedel, 1875 — C 256).

Young in down. See, Dresser *c III.*

Eggs. Like all Ducks' eggs, but rather dark with a tint of clay-colour: size about 57 × 40 (Uleåborg, Lappland).

Nest. Chiefly composed of the dark brown down of the bird, bits of grass-stalk, etc. intermixed; placed on the ground near the water.

Distribution. "Palaearctic Region from the Atlantic to the Pacific; in the Ethiopian Region it extends as far south as Shoa, and apparently breeds in the high lakes of Abyssinia; in winter in South China, Japan and India, but not in Ceylon or in Burmah; accidental in the Malay Archipelago (Philippines and Borneo), and in Polynesian Islands: Marianne Islands and Pelew Islands" (Salvadori *e 2*). Philippines — Luzon (Maitland-Heriot *e 2*), Basilan (Steere *a 2*); Labuan (Everett *c 5*, *e 2*); North Celebes — Gorontalo (Riedel in Dresden Mus.); Marianne Is. (Quoy & Gaimard *d 1*, *c 2*); Pelew Is. (Tetens *c 2*).

The Tufted Duck is now recorded for the first time from Celebes, the two specimens in the Dresden Museum from Dr. Riedel, which were most probably shot on the Lake of Limbotto, being the only ones as yet known from the island. Its nearest breeding grounds known are in South-east Siberia; it is a winter visitor in China and Southern Japan. In Europe also, as is shown by Dresser's studies, it is in general a northern species in summer, breeding abundantly in Finland and North Russia. Further south it is much rarer in the breeding season; it is known to nest in two or three spots in England and Scotland, and more plentifully in North Germany. Certainly one of its southernmost nesting stations is Saxony, where, though the eggs (at this moment) have not yet been taken, it breeds in one or two places — among them, on two of the fish-ponds at Moritzburg near Dresden (see Meyer & Helm, VII.—X. Jahresber. orn. Beob.-stat. Kgr. Sachsen, 1896, p. 131).

The male of the present species may be easily recognised at a great distance by its crest, black back and breast, and white belly. Its form is short and compact, and it is a more incessant diver than its allies on fresh waters. *N. marila* is distinguishable by its grey back and crestless head, *N. novaezealandiae* by having hardly any exposed white on the secondaries, no crest, and the abdomen brown. Count Salvadori separates these species and two American forms generically from *Nyroca*, but his genus *Fuligula* is one of those forms calling for a close comparison with *Nyroca* before the differences can be seen, and we are very doubtful whether it ought to be separated even subgenerically.

ORDER STEGANOPODES.

The Frigate-birds, Cormorants, Gannets, Tropic-birds and Pelicans form an order of natatorial birds, some of which (the Tropic-birds) bear some resemblance to the Terns, others (the Darters) to the Divers and Grebes, others (the Pelicans) to the Duck-family, but the *Steganopodes* may always be distinguished by their feet which have a continuous web, the hind toe being placed laterally on the inner side and connected with the others by a web (almost absent in the Frigate-birds). They differ further from other natatorial birds (except the Petrels and Penguins) in having their young hatched blind and helpless, and in other points.

FAMILY FREGATIDAE.

The Frigate-birds are well characterized by the bill which is about twice as long as the head, nearly straight, with a terminal hook like that of a Bird-of-prey; by the extremely long wing, coupled with magnificent powers of flight; by the very short tarsus, about $^1/_4$ the length of the middle toe and claw; by the feet, webbed only towards the base of the anterior toes, with the hallux practically free, and the claw of the middle toe very long and pectinated. The sexes are somewhat different, the old male being ornamented about the inter-scapulary region with glossy hackle-feathers.

GENUS FREGATA Briss.

Description as for the family.

375. FREGATA MINOR (Gm.).

Lesser Frigate-bird.

Fregata minor [Brisson, Orn. 1760, VI, 509]; *(1)* Schl., Mus. P.-B., Pelecani, 1863, 3; *(2)* Sclat. & Salv., P. Z. S. 1878, 650; *(3)* Legge, B. Ceylon 1880, 1203; *(4)* Hume, Str. F. 1880, IX, 119; *(5)* Salvad., Orn. Pap. 1882, III, 404; *(6)* Oates, B. Br. Burmah 1883, II, 228; *(7)* Pleske, Bull. Ac. Sc. Petersb. 1884, XII, 137; *(8)* Brd., Brew. & Ridgw., Water B. N. Am. 1884, II, 128; *(9)* Büttik., Notes Leyd. Mus. 1886, VIII, 68; *(10)* Ridgw., Man. N. Amer. B. 1887, 83; *(11)* Sharpe, Ibis 1888, 204; *(12)* W. Blas., t. c. 373; *(13)* Everett, J. Str. Br. R. A. S. 1889, 187; *(14)* Whitehd., Ibis 1890, 61; *(15)* Sh. & Whitehd., t. c. 149; *(16)* Sh., ib. 285; *(17)* Salvad., Agg. Orn. Pap. 1891, 211; *(18)* Sibree, Ibis 1892, 271; *(19)* Newt., Dict. B. 1893, p. 294; *(20)* Bns. & Worces., B. Menage Exped. 1894, 32; *(21)* Vorderm., N. T. Ned. Ind. 1895, LIV, 324; *(22)* Grant, Ibis 1896, 128.

a. **Pelecanus minor** *(1)* Gm., S. N. 1788, I, 572.

b. **Tachypetes minor** *(1)* Vieill., Nouv. Dict. XII, 144 (1817); *(2)* Gould, Hb. B. Austr. 1865, II, 499; *(3)* Finsch & Hartl., Orn. Centralpolyn. 1867, 267; *(4)* Sharpe,

Rep. Trans. Venus Exp., B. Kerguelen 1877, 52; *(5)* Hartl., Vög. Madag. 1877, 399; *(6)* Lay., Ibis 1878, 265; *(7)* Sharpe, P. Z. S. 1879, 353; *(8)* Nichols., Ibis 1882, 71; *(9)* North, Nests and Eggs B. Austr. 1889, 364.

c. **Atagen ariel** [Gould MS.]; *(I)* Gray, Gen. B. III, 669, Nr. 2, pl. 184 (1845); *(II)* Gould, B. Austr. 1848, VII, pl. 72.

d. **Tachypetes ariel** *(1)* v. Musschenbroek, N. T. Ned. Ind. 1876, XXXVI, 380.

e. **Atagen** (or **Attagen**) **minor** *(1)* David & Oust., Ois. Chine 1877, 534; *(2)* Kelham, Ibis 1882, 202; *(3)* Rams., Tab. List 1888, 25.

f. **Tachypetes aquila** var. **minor** *(I)* Milne-E. & Grand., Ois. Mad. 1879, I, 705, pls. 286—8 (III).

g. **? Fregata aquila** *(1)* Brügg., Abh. Ver. Bremen 1876, V, 99.

For further synonymy and references cf. Salvadori *5*.

Figures and descriptions. Gray *c I*; Gould *c II*; Schlegel *1*; Legge *3*; Hume *4*; Salvad. *5*; Baird, Brewer & Ridgway *8*; Ridgway *10*; Milne-Edwards & Grandidier *f I* (skel.); etc.

Adult male. Schistaceous black, the feathers of head, neck and back lanceolate and glossed with green and violet; a patch on the flanks white; tail very long and deeply forked; chin and middle of throat bare, "deep red" (♂, Macassar, 17. Sept. 1895: P. & F. Sarasin).

"Iris red; bill grey; skin of throat red; eyelid black; legs and feet black" (Legge *3*).

Female. Breast, flanks, sides, and a narrow collar round the lower neck white; the rest of the plumage, including the abdomen, brownish black, the remiges and rectrices glossed with violet, the head with green and violet, the lesser and middle wing-coverts broadly edged with whitish, the back with brownish edgings; much less of the throat bare than in the male (♀, Macassar, 9. IX. 95: Sarasin Coll.).

Young male. Head and neck white, washed with cinnamon, deeper cinnamon on the jugulum; abdomen white; lower breast, sides, flanks, and under tail-coverts brownish black with a purplish gloss; upper parts as in the adult female; "iris dark brown; bill bluish, anteriorly whitish; feet bluish with a flesh-red tint" (♂ juv. 27. VII. 94, near Manado: Sarasin Coll.).

Young female. Like the young male, but with more white about it: most of the breast and sides white; the head and neck deeply stained with cinnamon (♀, Macassar, 9. IX. 95: Sarasin Coll.).

Measurements.	Wing	Tail	Tarsus	Exp.culm. straight
a. (Sarasin Coll.) ♂ ad., Macassar, 17. IX. 95	540	350	15	85
b. (Sarasin Coll.) ♂ ad., Macassar, 17. IX. 95	—	420	16	100
c. (Sarasin Coll.) ♂ vix ad., Macassar, 8. IX. 95	—	—	—	100
d. (C 6961) [♂] ad., Celebes, 1883 (Ribbe & Kühn)	585	355	—	97
e. (Sarasin Coll.) ♀ ad., Macassar, 9. IX. 95	555	300	—	91
f. (Sarasin Coll.) ♂ juv., Manado, 27. VII. 94	565	350	—	100
g. (Sarasin Coll.) ♀ juv., Macassar, 9. IX. 95	565	340	—	90
For comparison:				
h. (Nr. 11847) [♂] ad., *F. minor*, America?	503	320	—	90
i. (C 13417) ♂ ad., *F. aquila*, Bahamas, 15. V. 92	620	460	—	108
j. (C 13418) ♀ ad., *F. aquila*, Bahamas, 2. II. 92	685	460	—	120

Nestling. Clothed in white down.

Nest and eggs. Breeds in colonies, forming a nest of sticks and twigs on the ground or on

a low bush; eggs 1—2, of a chalky whiteness: 63.5 × 43.2 mm (Islands of Torres Straits, North *b 9*). Interesting accounts of the breeding of the large form *F. aquila* will be found in Baird, Brewer and Ridgway *(8)*.

Distribution. Indian and Pacific Oceans. The range has not yet been satisfactorily determined. — Coasts of Celebes (Ribbe & Kühn, P. & F. Sarasin, ? Rosenberg *g 1*).

A series of six Frigate-birds were obtained by the Drs. Sarasin on the coast of Celebes, and these, with another from the island collected by Ribbe and Kühn, are before us. The difficulty of determining them is very great. We are only able to state that one specimen may be determined as *F. minor*, and that the others may perhaps belong to a slightly larger race, though smaller than specimens of *F. aquila* from the Bahama Islands. The Frigate-birds breed in great colonies, and we incline to the opinion that we have to do with individuals from two different colonies, which vary racially, as do members from different colonies of the Edible-nest Swifts, *Collocaliae*. At present two species of *Fregata* are recognised — *F. aquila* and *F. minor*, and most authorities write of them as if it were the easiest matter imaginable to distinguish them, though others confess themselves greatly perplexed. Among the opinions expressed it may be cited that Schlegel *(1)* distinguished *F. minor* by its smaller size and white flanks; Oustalet *(e 1)* would distinguish *F. minor* not only by its smaller size, but by its naked throat and more uniform plumage; Legge *(3)* like Schlegel by its smaller size and, in the adult male, by the white patch on the flanks; Salvadori *(5)* by the smaller size of *F. minor*, its white flanks and by its glossy green (more or less bluish) back and scapulars — as against violet in *F. aquila*; Sharpe *(b 7)*, having questioned the validity of *F. minor* elsewhere *(b 5)*, was again inclined to separate it, after examples from Borneo, by reason of the "red" colour of the bill (Legge says "grey", Gould "bluish horn") and much shorter wings and toes; Ridgway *(10)* found the plumage of *F. minor* "not very obviously different" from *F. aquila*, while large specimens of the former had much longer wings than small specimens of the latter, but the bill (culmen) of *F. aquila* was found to measure more than 4.15 in. (105 mm), that of *F. minor* less than this.

Three adult, or nearly adult, specimens from Celebes in the Sarasin Collection and the Dresden Museum want the white patch on the flanks, and should therefore be *F. aquila;* but their size is not large, their bills under 105 mm and the upper surface more or less glossed with green, for which reasons they should be *F. minor*, but, besides the absence of the white side-patches, their bills are larger than in the more typical specimen of that bird before us. They seem to break through the supposed line of separation between *F. minor* and *aquila* and make it probable that the maintenance of the two names is misleading, and that there are not two species of Frigate-bird, but, as suggested above, a number of ancient colonies, the inhabitants of which differ more or less from one another in size and other characters. Want of material renders it advisable for us, however, to leave matters as they are for the present.

The Frigate-bird is perhaps the finest flyer among birds, and those, who have watched them in nature, have much that is interesting to say about their magnificent evolutions on the wing, and their densely crowded breeding islands. They feed on fish and other marine animals, often harassing other sea-birds and causing them to disgorge their prey.

FAMILY PHALACROCORACIDAE.

Toes fully webbed, the outermost one the longest, much longer than the tarsus, claw of middle toe pectinated; plumage generally dark and glossy above; wings rather short, reaching to about the base of the tail; tail moderately long and stiff, usually rounded, 12 or 14 feathers, upper tail-coverts short; neck long; nostrils wanting. The Darters and Cormorants are best distinguished from other *Steganopodes* by the outer toe being considerably the longest, and by their short wings and stiff tails.

GENUS PLOTUS L.

The Darters differ from the Cormorants chiefly by the straight slender bill, with the tomia furnished with long serrations directed backwards; by the extremely long neck, which is as long or longer than the body; and by the absence of any appreciable pouch on the upper throat. The genus is represented by four species in the warm parts of America, Africa, and Asia to Australia.

376. PLOTUS MELANOGASTER (Penn.).

Indian Darter.

a. **Anhinga melanogaster** *(1)* Penn., Ind. Zool. 1781, p. 13, pl. XIII; *(2)* Newt., Str. F. 1879, IX, 415; *(3)* Hartert, J. f. O. 1891, 302.

Plotus melanogaster *(1)* Gm., S. N. 1788, I, 580, pt.; *(2)* Lath., Ind. Orn. 1790, II, 865; *(3)* Horsf., Tr. L. S. XIII, 1821, 198; *(4)* Raffl., t. c. 1822, 330; *(5)* Begbie, Malay Penin. 1834, 515; *(6)* Gray, Gen. B. III, 664 (1848); *(7)* Blyth, Cat. B. Mus. A. S. B. 1849, 299; *(8)* Bp., Consp. 1855, II, 181; *(9)* Schl., Mus. P.-B, Pelecani, 1863, 26, pt.; *(10)* Jerd., B. India 1864, III, 861; *(11)* Mart., J. f. O. 1866, 230; *(12)* Wald., Tr. Z. S. 1872, VIII, 106; *(13)* Meyer, J. f. O. 1873, 405; *(14)* Adam, Str. F. 1873, I, 403; *(15)* Ball, ib. 1874, II, 440; *(16)* Wald., Tr. Z. S. 1875, IX, 247; *(17)* Salvad., Cat. Ucc. Borneo 1874, 367 pt.; *(18)* Brügg., Abh. Ver. Bremen 1876, V, 99; *(19)* Hartl., Vög. Madag. 1877, 396; *(20)* Rosenb., Malay. Archip. 1878, 279; *(21)* Hume & Davis., Str. F. 1878, VI, 496; *(22)* Meyer, Ibis 1879, 145; *(XXIII)* Milne-Ed. & Grandid., Ois. Madag. 1879, I, 690, pls. 284, 285 (syn. emend.); *(24)* Legge, B. Ceylon 1880, 1194; *(25)* Rosenb., Zool. Garten 1881, 167; *(26)* W. Rams., Index Tweedd. Orn. Works 1881, 660; *(27)* W. A. Forbes, P. Z. S. 1882, 208; *(28)* Salvad., Orn. Pap. 1882, III, 407; *(29)* Kelh., Ibis 1882, 203; *(30)* Oates, B. Br. Burmah 1883, II, 235; *(31)* Vorderm., N. T. Ned. Ind.

1883, XLIII, 197; *(32)* W. Blas., J. f. O. 1883, 140; *(33)* Joest, Holontalo 1883, 106; *(34)* H. Parker, Ibis 1883, 194, 195; *(35)* Oust., Ann. Sc. Nat. 1882, XIII art. 7, p. 7; *(36)* Cazin, Ann. Sc. Nat. 1884, XVIII, 128; *(37)* C. Swinh. & Brns., Ibis 1885, 138; *(38)* Tristr., Ibis 1886, 41 pt.; *(39)* W. Blas., Z. ges. Orn. 1886, 175; *(40)* Salvad., Ann. Mus. Civ. Gen. 1886, (2) IV, 617, *(41)* Vorderm., N. T. Ned. Ind. 1886, XLVI, 240; *(42)* Gurney, Ibis 1887, 336; *(43)* Whitehd., Ibis 1888, 412; *(44)* Vorderm., N. T. Ned. Ind. 1889, XLIX, 419; *(45)* id., ib. 1889, L, 409; *(46)* Everett, J. Str. Br. R. A. S. 1889, 188; *(47)* Hartert, J. f. O. 1889, 407; *(48)* Sharpe, Ibis 1890, 149, 285; *(49)* Steere, List Coll. B. & M. Philipp. Is. 1890, 27; *(50)* Heine & Rchw., Nomencl. Mus. Hein. 1890, 352; *(51)* Oates ed. Hume's Nests and Eggs 1890, 274; *(52)* Sibree, Ibis 1892, 272; *(53)* Hose, Ibis 1893, 420; *(54)* Büttik., Zool. Erg. Weber's Reise 1893, III, 285; *(55)* Whitehd., Exped. Kina Balu 1893, 32.

"Dondohulu", Rosenberg, or **"Tontohulu"**, Joest, in Gorontalo.

For further references cf. Oates *30*.

Figures and descriptions. Pennant *a I*; Milne-Edwards & Grandid. *XXIII* (skel.); Legge *24*; W. A. Forbes *27* (stomach); Oates *30*; Vorderman *31*; etc.

Adult. Head and neck tawny-olive-brown, streaked with black, most intensely on head above and hind neck; a fine white line from forehead to behind eye; a white stripe from suborbital region to nearly half-way down side of neck; chin and upper throat white, with brown centres to most of the feathers; scapulars, wings and tail black, spotted with silver-white on the shoulders, extending into broad mesial stripes on the scapulars; wing-coverts silver-white, edged with black; back, rump, upper tail-coverts, jugulum and under parts glossy black more or less tinged with greenish or brownish (Manado: v. Musschenbroek — C 5277).

"Iris pearly white, with an inner and outer ring of yellow; bill with the upper mandible brownish olive, paling into horny grey at the tip; under mandible yellow, changing into greyish green at the base; legs and toes bluish; inside of tarsus and webs yellowish; toes dusky at the tips" (Legge *24*).

Female. Resembles the male, but "the neck is more fulvous; the black on the chest is bordered by a yellowish band which extends up the neck, and the streaks on the upper plumage are yellowish" (Oates *30*).

Nestling. Covered with white down.

First plumage. The assumption of the earliest dress is well described by Legge *(24)*; in the first plumage the black feathers of the under-parts have pale tips, the white stripe on the face and neck is only indicated, the scapulars, though lanceolate, are short and have fulvous margins.

Observation. One of our specimens from Celebes — apparently a female — has the abdomen dull umber-brown, perhaps a result of attrition of the black ends of the feathers (Manado, March, 1871: Meyer — C 2008).

Measurements. Wing 345 mm; tail 260; tarsus 40; middle toe and claw 72; exposed culmen 79 (ad.: Manado — C 5276).

Eggs. 3—5. "The eggs resemble those of the known *Graculus*-species, are white, with a chalky coating, seen against the light grey. They measure 56—57 × 35—36 mm" (Nehrkorn MS.). See also Whitehead *43*, Hume *51*.

Nest. Of small sticks, a firm structure, lined with leaves. The bird breeds in colonies, in low trees round the water (Whitehead *43*).

Distribution. India (Jerdon, Hume, etc. *a I, 10, 14, 15, 24, 37*); Ceylon (Legge, etc., *24, 34*); Burmah (Oates *30*, Fea *40*); Tenasserim (Davison *21*); China (f. Bonap. *8*);

Malay Peninsula (Begbie *5*, Kelham *29*, Hartert *47*); Sumatra (Raffles *4*, *17*, *44*); Java (Horsfield, Salomon Müller, etc. *3*, *9*, *31*); Borneo (Beccari, etc. *17*, *46*, *53*, *55*); Philippines — Luzon (Meyer *16*), Negros (Layard *16*), Mindoro (Steere *49*, Schmacker *a 3*); Celebes — Manado (Meyer *12*, *13*, *22*), Gorontalo Distr. (Rosenb. *18*, *20*, *25*, Riedel *39*), Pampanua, S. Peninsula (Weber *54*); Madagascar (Pollen *19*).

The Indian Darter most closely resembles ***Plotus novaehollandiae*** Gould of Australia and New Guinea, which has the lower fore-neck hazel, and a second white stripe bordering the bare skin behind the chin. In the Region of the Caucasus and Western Asia another allied form, *P. chantrei* Oust., has been described *(35)*. In Africa it is represented by *P. levaillanti*, and in the warm parts of N. and S. America by *P. anhinga*, but these species differ more widely. The Darters are easily recognisable by their long, thin necks and straight serrated bills, and this creates an appearance which has given rise to the name "Snake-bird" for them. For the rest, they are very like Cormorants. Their powers of diving are very great, and they have the capacity, like the Grebes, of submerging the body, so that they are capable of swimming with the head only above water. A curious character of their plumage is the corrugated, or ribbed, character of the outer web of the innermost remex and of the outer web of the middle tail-feathers.

In Celebes the Indian Darter has as yet been recorded from three localities only, among them Lake Limbotto where it seems to be plentiful, for Rosenberg got 14 specimens there, and it is to be expected that it will be found on all the lakes of the island which are suited to its mode of life. It is said to feed entirely upon fish by Legge, who gives an excellent description of its habits *(24)*.

GENUS PHALACROCORAX Briss.

In the Cormorants the bill is generally longer than the head, hooked at the tip, not serrated; anterior malar region and upper throat naked; feet completely webbed, the outermost toe much the longest, the claw of the middle one serrated; wings rather short, rounded to fit the body; tail moderately long, the feathers 12 or 14 in number, stiff, and exposed almost to their bases owing to the shortness of the upper tail-coverts; exterior nostrils wanting. Food: fish.

Range: cosmopolitan.

377. PHALACROCORAX MELANOLEUCUS (Vieill.).

Pied Cormorant.

a. **Hydrocorax melanoleucus** *(1)* Vieill., Nouv. Dict. 1817, VIII, 88.

b. **Carbo dimidiatus** *(1)* Less., Tr. d'Orn. 1831, 604 (ex Cuv. MS.); *(2)* Finsch, Neu Guinea 1865, 183; *(3)* Rosenb., Zool. Garten 1881, 167; *(4)* W. Blas., J. f. O. 1883, 127, 128.

c. **Graculus melanoleucus** *(1)* Gray, Gen. B. 1845, III, 667, Nr. 23; *(II)* Rchb., Natatores t. XXXV, figs. 872—73; *(3)* Schl., Mus. P.-B., Pelecani, 1863, 15; *(4)* Finsch, J. Mus. Godef. 1875, VIII, 48; *(5)* v. Musschenbroek, N. T. Ned. Ind. 1876, XXXVI, 380; *(6)* Brügg., Abh. Ver. Bremen 1876, V, 99; *(7)* Joest, Holontalo 1883, 105; *(8)* Ramś., Pr. L. Soc. N. S. W. 1887, (2) II, 203; *(9)* id., Tab. List 1888, 25; *(10)* North, Nests & Eggs B. Austr. 1889, 366.

Phalacrocorax melanoleucus *(I)* Gould, B. Austr. 1848, VII, pl. 70; *(2)* id., Hb. B. Austr. 1865, II, 493; *(3)* Wald., Tr. Z. S. 1872, VIII, 106; *(4)* Buller, B. N. Zealand 2nd ed. 1888, II, 173; *(5)* Hart., Nov. Zool. 1896, 598.

d. **Microcarbo melanoleucus** *(1)* Gray, HL. 1871, III, 129, Nr. 11145; *(2)* Salvad., Orn. Pap. 1882, III, 410; *(3)* Sharpe, Rep. Voy. Alert 1884, 28; *(4)* Meyer, Z. ges. Orn. 1884, 271, 295; *(5)* W. Blas., ib. 1886, 173; *(6)* Wiglesw., Av. Polyn. 1892, 72; *(7)* Salvad., Agg. Orn. Pap. 1891, 211; *(8)* Meyer, J. f. O. 1892, 266; *(9)* Madarasz, Aquila 1894, 106; *(10)* Hart., Nov. Zool. 1896, 181; *(11)* Salvad., Ann. Mus. Civ. Gen. 1896, XXXVI, 119.

e. **Graculus dimidiatus** *(1)* Rosenb., Malay. Archip. 1878, 279.

f. **Carbo melanoleucus** *(1)* Rosenb., Zool. Garten 1881, 167; *(2)* W. Blas., J. f. O. 1883, 127, 128.

g. **Carbo sulcirostris** *(1)* v. Rosenb. (nec Brandt)[1]), Zool. Garten 1881, 167; *(2)* W. Blas., J. f. O. 1883, 127, 128; *(3)* id., Z. ges. Orn. 1886, 174.

"Manon-ulobo", Rosenberg, or **"Monunulopo"**, Joest, Gorontalo.

For further synonymy and references cf. Salvadori *d 2*, *d 7*.

Figures and descriptions. Gould *I*, *2*; Reichenbach *c II* (after Gould); Salvadori *d 2*; Buller *4*.

Adult. Upper surface, with under wing-coverts and sides of body glossy black, the scapulars and wing-coverts powdery green-black, with jet-black edgings to the feathers; under parts, throat and sides of neck, face, superciliary region and forehead next base of bill glossy white (Aru: Riedel — C 6301).

"Irides greyish white; bill yellow, except the culmen which is dark horn-colour; orbits dull reddish brown; throat (naked pouch) yellow; legs and feet black" (Gould *I*).

Sex. The sexes are similar in coloration (Gould *I*).

Immature. The feathers of the upper surface edged with whitish brown; the head above and hind neck more brown than black owing to the pale edgings (Sumba: Riedel — C 6300).

Measurements.	Wing	Tail	Tarsus	Outer toe and claw	Exposed culmen
a. (C 15919) ad., loc. incog. (Riedel)	242	173	40	—	33
b. (C 6301) ad., Aru (Riedel)	238	170	—	71	31
c. (C 6299) vix ad., Timor (Riedel)	235	—	38	—	32
d. (C 6300) juv., Sumba (Riedel)	250	—	—	72	33
e. (C 10429) ♂ ad., Germ. N. Guin. 1891 (Geislers)	217	143	35	64	33
f. ad., Gorontalo (Riedel fide W. Blas. *d 5*) .	216	166	36	—	31

Eggs. "The eggs are, like all *Graculus*-species, white, and furnished with a chalky coating, under which the bluish shell-colour shines through. 43 × 31 mm" (Nehrkorn MS.). See, also, Finsch *c 4*, North *c 10*.

Nest. Of sticks, placed on a bush in or near the water (North *c 10*).

Distribution. Australia and Tasmania (Peron, Gould, Ramsay *I*, *d 2*, *c 8*); New Caledonia

[1]) See the next article.

(Marie *d 6*); Is. of Torres Straits (Macgillivray *d 2*, Voy. Alert *d 3*); Papuasia — New Guinea, Salawatti, Aru, Kei, Mysol, Waigiou (fide Salvadori *d 2*, *d 7*); Moluccas — Ceram, Amboina, Batchian, Halmahera, Ternate (*d 2*, *d 7*); Timor (S. Müller *c 3*, Riedel); Sumba (Riedel *d 12*); Lombok (Everett *5*); Celebes area — Djampea (Everett *d 10*); N. Celebes — Gorontalo (Forsten *c 3*, v. Rosenberg *e 1*, *b 3*, *f 1*, *c 6*, Riedel *d 5*, v. Musschenbroek *c 5*); Pelew Islands (Tetens & Kubary *c 4*, *d 6*); ? New Zealand (Buller *4*).

About a dozen specimens of the Pied Cormorant have been collected in Celebes, all, apparently, on the large, shallow, weed-overgrown lake of Limbotto. Rosenberg says it is fairly common here and attracts attention to itself from its habit of sunning itself on branches of trees overhanging the water, with half-expanded wings after the fashion of a heraldic eagle.

The Little Pied Cormorant has a rather short and strong bill, yellow in colour except on the culmen, and with a slight denticulation towards the end of the tomium. The tail is rather long, the feathers twelve in number. This is the number in the Shag, *P. graculus*, but the Common Cormorant, *P. carbo*, has fourteen. Gould (*I*) represents *P. melanoleucus* with its auricular and occipital feathers very smartly brushed up, so as to form a sort of side-fringe to the hind head and nape; this mode of bearing the feathers is not apparent from skins. Though very distinct as a species, we have been unable to find sufficient reason for separating it generically from *Phalacrocorax*.

378. PHALACROCORAX SULCIROSTRIS Brdt.

Little Black Cormorant.

Phalacrocorax sulcirostris (Brandt); (*1*) Gray, List Anseres Brit. Mus. 1844, 185; (*II*) Gld., B. Austr. 1848, VII, pl. 67; (*3*) Hart., Nov. Zool. 1896, 598.

a. **Graculus sulcirostris** (*1*) Gray, Gen. B. 1845, III, 667, Nr. 11; (*II*) Rchb., Natatores t. 316, figs. 2547—48; (*3*) Schl., Mus. P.-B., Pelecani, 1863, 13; (*4*) v. Musschenbr., N. T. Ned. Ind. 1876, XXXVI, 381; (*5*) Büttik., Zool. Erg. Weber's Reise 1893, III, 306.

b. **Phalacrocorax stictocephalus** (Bp.); (*1*) Gld., Hb. B. Austr. 1865, II, 495.

c. **Microcarbo sulcirostris** (*1*) Salvad., Cat. Ucc. Borneo 1874, 365; (*2*) id., Orn. Pap. 1882, III, 408; (*3*) Everett, J. Str. Br. R. A. S. 1889, 188.

d. **Graculus stictocephalus** (*1*) Rams., Tab. List 1888, 25; (*2*) North, Nests & Eggs B. Austr. 1889, 367.

For further synonymy and references cf. Salvadori *c 2*.

Figures and descriptions. Gould *II*, *b 1*; Reichenbach *a II*; Schlegel *a 3*; Salvad. *c 2*.

Adult. Glossy green-black, the feathers of the back, scapulars and upper wing-coverts of a mealy greyish green appearance with black edges; superciliary region and sides of occiput with small white streaks; wing 260 mm; tail 160; tarsus 45; outer toe with claw 81; exposed culmen 49 (ad., locality uncertain — Nr. 11667).

A second example (West Australia, Nr. 11105) has the exposed culmen only 38 mm long; wing 234.

"Irides deep grass-green; orbits and gular pouch brownish black, the pouch strongly tinged with blue; feet black" (Gould *II*).

Eggs. Elongated ovals, pale bluish white, thickly coated with lime: 53—54 × 36—37 mm (North *d 2*).

Distribution. Australia (Gould, Ramsay *II, b 1, d 1*); New Guinea, Kei, Aru, Amboina, Ceram, Batchian, Halmahera (see Salvadori *c 2*); Flores (Weber *a 5*); Celebes — Lake Limbotto (v. Musschenbroek *a 4*); South Borneo (Croockewit *a 3, c 3*); Lombok (Everett *3*).

An example of an entirely dark-coloured species of Cormorant was obtained by van Musschenbroek at Limbotto and was somewhat doubtfully determined by him as *P. sulcirostris*.

We were much interested to learn from Mr. Büttikofer that this specimen is in the Leyden Museum and that it is a true *P. sulcirostris*. Von Rosenberg (Zool. Garten 1881, 167) indicated no fewer than six *P. sulcirostris* as having been shot by him and his hunters at Limbotto, but the indication has been much questioned by Prof. W. Blasius (J. f. O. 1883, 127; Ztschr. ges. Orn. 1886, 174), who suggested that they were *P. melanoleucus* and with perfect right. Mr. Büttikofer writes that van Musschenbroek's example "is the only specimen of *P. sulcirostris* known to me from Celebes. The specimens recorded by von Rosenberg under this name from Celebes all belong to *P. melanoleucus*; they make part of our collections!"

When adult this species is easily distinguished from *P. melanoleucus* by its entirely green-black plumage, as well as by its bill, which is weaker, with the culmen much broader and more rounded. We are not acquainted with the young of *P. sulcirostris*, but that of *P. javanicus* is brown above and pale grey on the under parts, much as that of *P. pygmaeus*. The adult *P. javanicus* is distinguished by its white upper throat and small bill and the absence of white spots on the head; *P. pygmaeus* by its chestnut head and upper neck, and the small white longitudinal spots on the under surface and lower neck.

FAMILY SULIDAE.

The bill of the Gannets is longer than the head, large at the base, tapering towards the tip, without external nostrils, the tomia serrated for the terminal half; more or less of the upper throat and base of jaw naked; tarsus shorter than the toes, the middle toe with the serrated claw slightly longer than the outer one; wings long, about twice the length of the secondaries; tail moderate; a "system of subcutaneous air-cells, some of large size, pervading almost the whole surface of the body, communicating with the lungs, and capable of being inflated or emptied at the will of the bird" (Newton, D. B. 1893, 303).

GENUS SULA Briss.

Description as for the family.

379. SULA LEUCOGASTER (Bodd.).

Booby Gannet.

This wide-spread species seems to be smaller in size in the Atlantic than in the Pacific Ocean. There not being sufficient material in the Dresden Museum for a proper geographical study of the species, the following references bear only upon its occurrence in the Celebesian Province:

a. **Sula fiber** (nec L.); *(1)* Schl., Mus. P.-B., Pelecani, 1863, 41; *(2)* Salvad., Ucc. Borneo 1874, 369; *(3)* Brügg., Abh. Ver. Bremen 1876, V, 464; *(4)* Rosenberg, Malay. Archip. 1878, 279.

b. **Dysporus sula** *(1)* Wald., Tr. Z. S. 1872, VIII, 106; *(2)* Meyer, Ibis 1879, 145; *(3)* W. Blas., J. f. O. 1883, 140.

c. **Sula fusca** *(1)* v. Musschenbr., N. T. Ned. Ind. 1876, XXXVI, 380.

Sula leucogaster (Bodd.); *(1)* Legge, B. Ceylon 1880, 1177; *(2)* Salvad., Orn. Pap. 1882, III, 421; *(3)* Meyer, Isis, Dresden 1884, 6, 57; *(4)* W. Blas., Ornis 1888, 633; *(5)* M. & Wg., Abh. Mus. Dresd. 1896, Nr. 1, p. 15.

Adult. Entire upper parts, with throat and jugulum, warm bistre-brown; remaining under parts white (ad., Atlantic Ocean, Nr. 11101).

Young. Paler and greyer brown, the under parts whitish brown, instead of white (♂ juv., Gulf of Boni, 19. I. 95: Sarasin Coll.).

Measurements (two young examples from Celebes). Wing 395, 430 mm; tail 215, 215; tarsus 35, 45; middle toe and claw c. 88; exposed culmen 83, 105.

Distribution (as a species). Most of the tropical and subtropical seas of the globe. — In the Celebesian Province: Celebes (v. Rosenberg *a 4*, v. Musschenbroek *c 1*, P. & F. Sarasin *5*); Sangi Islands — Great Sangi and Siao (Meyer *3*).

Some half dozen examples of this Gannet have been recorded from Celebes, where, according to v. Rosenberg, it appears at times in flocks of 10—12, chasing the shoals of fish swimming near the surface. The habits of the species have been well described by Dr. Bryant and others (see Baird, Brewer and Ridgway, Water B. N. Am. 1884, II, 181; Gould, Hb. B. Austr. 1865, II, 507). The birds breed in colonies, and two white eggs are laid on the sand, rock, etc., or in a nest slovenly made of dried herbage; the young are at first naked and livid blue in colour, but soon become covered with white down.

Sula piscatrix (L.).

This species has not yet, so far as we know, been recorded actually from Celebes, but Büttikofer (Zool. Erg. Weber's Reise 1893, III, 285) mentions the skeleton of a Gannet shot between Madura and Celebes as belonging to this species, and it is certain ultimately to be found on the coasts. The adult is easily distinguishable from *S. leucogaster* by its white plumage (except the remiges and greater wing-coverts, which are dusky grey); the young is not always easy to distinguish, but in life it has red feet, the young of *S. leucogaster* greenish yellow legs and feet.

ORDER LARI.

The systematic position of the Gulls — whether they should be placed nearer to the Plovers or to the Petrels — is not yet decided; perhaps an intermediate position would be most correct. They have the following characters whereby they may be distinguished as an order. They are of more or less exclusively natatorial habits, feeding chiefly upon fish, and furnished with webbed feet (in some genera the webs much indented), differing, especially by the former point, from the *Charadriidae*; the young are covered with down and spotted, and are able to leave the nest at an early age; the eggs are richly spotted, and do not apparently exceed 3 in number; the nostrils are schizorhine — wherein they differ from the *Tubinares* and *Steganopodes;* further from the former by the shape of the tongue, coracoid, furcula and hypotarsus, etc. (Gadow), from the latter by the hind toe, when present, not being webbed and joined on to the other toes; the bill is simple, not furnished with a nail at the tip or serrations or lamellae at the edges; the wing is long, the ulna exceeding the humerus — whereby they differ from the Ducks, as well as by their eggs, young, and various osteological characters.

FAMILY LARIDAE.

Mr. Howard Saunders divides the *Lari* or *Gaviae* into two families, *Laridae* and *Stercorariidae*, the former being distinguishable by their "bill without a cere; sternum with two notches on each side of the posterior margin; toes partially or fully webbed; claws feeble or moderate". He subdivides the *Laridae* into *Sterninae*, *Rhynchopinae* and *Larinae;* the *Sterninae* have a straight, tapering bill with both mandibles of about equal length, whereas in the *Larinae* the tip of the maxilla turns down over the mandible, while the bill of *Rhynchops* is of abnormal appearance, the lower mandible projecting considerably beyond the upper one.

GENUS HYDROCHELIDON Boie.

These small, Marsh Terns are distinguishable from the other Terns by their having the feet webbed only about as far as the first joint of the middle toe, and the feet do not appear to be used for swimming. There are four species, generally of dusky plumage.

380. HYDROCHELIDON LEUCOPTERA (Meisn. Sch.).

White-winged Black Tern.

a. **Sterna leucoptera** *(I)* Meisner & Schinz, Vög. Schweiz 1815, 264; *(II)* Naum., Vög. Deutschl. X, 214, t. 257 (1840); *(3)* Stejn., Bull. U. S. Nat. Mus. 1885, Nr. 29, 316; *(4)* Bns. & Worces., B. Menage Exped. 1894, 31.

b. **Sterna grisea** *(1)* Horsf., Tr. L. Soc. 1821, XIII, 199.

Hydrochelidon leucoptera *(1)* Boie, Isis 1822, 563; *(II)* Dresser, B. Europe VIII, 321, pls. 590, 591 (1875); *(3)* Saund., P. Z. S. 1876, 641; *(4)* David & Oust., Ois. Chine 1877, 524; *(5)* Legge, B. Ceylon 1880, 1000; *(6)* Oates, B. Br. Burmah 1883, II, 420; *(7)* Brd., Brew. & Ridgway, Water B. N. Am. 1884, II, 323; *(8)* Buller, B. N. Zeal. 2nd ed. 1888, II, 77; *(9)* Everett, J. Str. Br. R. A. S. 1889, 210; *(10)* Saund., Cat. B. 1896, XXV, 6.

c. **Hydrochelidon nigra** *(1)* Gray (nec Linn.), List Anseres Br. Mus. 1844, 180; *(2)* Wald., Tr. Z. S. 1872, VIII, 103; *(3)* Salvad., Cat. Ucc. Borneo 1874, 372; *(4)* id., Ann. Mus. Civ. Gen. 1877, IX, 63; *(5)* W. Blas. & Nehrk., Verh. z.-b. Ges. Wien 1882, 432; *(6)* W. Blas., ib. 1883, 73; *(7)* Meyer, Isis, Dresden 1884, 6; *(8)* W. Blas., Ornis 1888, 634; *(9)* Vorderm., N. T. Ned. Ind. 1891, LI, 413; *(10)* Büttikofer, Zool. Erg. Weber's Reise 1893, III, 285.

d. **Sterna nigra** *(1)* Schl., Mus. P.-B., Sternae, 1863, 31.

e. ?**Hydrochelidon hybrida** *(1)* Salvad. (nec Pall.), Orn. Pap. 1882, III, 566.

f. **Hydrochelidon fissipes** (Pall.); *(1)* Tacz., Faun. Orn. Sib. Orient. 1893, II, 1015.

For further synonymy and references cf. Saunders *10*.

Figures and descriptions. Naumann *a II*; Dresser *II*, and plates in other standard works on European birds; Legge *5*; Oates *6*; Buller *8*; Saunders *10*; etc.

Breeding plumage. Head, neck, mantle and under parts including under wing-coverts and axillaries black, deepest on head and neck; back and scapulars blackish grey; lesser wing-coverts and metacarpal edge white, becoming pearl-grey on the other wing-coverts and outer webs of primaries[1]), and more slate-grey on the secondaries; shafts of quills white; rump, vent, upper and under tail-coverts and tail white. Wing 210 mm; tail 67; tarsus 18; middle toe and claw 23; exposed culmen 23 (♂ ad., Europe — Nr. 1315).

"Iris dark brown; bill reddish black; inside of mouth yellowish red; legs and feet orange-red, claws black" (Legge *5*).

Sexes. Similar in coloration.

Winter plumage. Differs from the summer dress in having the black of the head, neck and under parts replaced by white, except on the occiput and nape, which are mottled with black, and there is a black spot in front of the eye.

Changing plumage. Moulting specimens, with the head, neck and under parts varied with black and white feathers, occur in early spring and autumn (Legge *5*, Saunders *10*).

Young. "Posterior portion of the crown, a patch on the side of the head and one on the hind neck dark sooty grey, the feathers with lighter margins, the patch on the hind neck with brownish markings; rest of the head, neck and entire under parts pure white; back and scapulars blue-grey, broadly tipped with blackish grey; wings as in the adult in winter, but the wing-coverts tipped with light reddish brown, rump and upper tail-coverts white; tail light French grey, becoming darker towards the tip" (Dresser *II*).

Eggs. 3, rarely 4; short oval; shell delicate, smooth, without gloss; dark olive-yellow or pale olive; shell-spots and dots grey-brown, thickly distributed, superficially blotched, dotted and scratched with reddish black-brown, or black (Naumann *a II*). Size 34 × 25.5 mm.

Nest. Formed of bits of reed, rush, grass-stalks etc. in spots far out in marshes.

Distribution. Central and Southern Europe in summer; Africa; temperate Asia eastward to E. Siberia *(f 1)*, south to Australia and New Zealand; once in Barbados; once in

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[1]) As Mr. Saunders *(10)* says, the pearl-grey, which has a frosted or velvety appearance on the primaries, soon wears off on the outer quills, leaving the webs sooty black.

Winconsin (Saunders *10*). — In the East Indies: Philippines — Mindanao (Bourns & Worcester *a 4*, Moseley *10*); Borneo (Grabowsky *c 6, 9*, Everett *10*); Java (Horsfield *b 1, 10*, Vorderman *c 9*); Celebes — North Peninsula (Forsten *d 1*), South Peninsula, Tempe (Weber *c 10*); Great Sangi (Bruijn *c 4, c 8*); ?Amboina (Platen *c 5, e 1, c 6*).

The White-winged Black Tern has been recorded three times from Celebes, two of the specimens being in the Leyden and the third in the British Museum. One specimen is known from Sangi. Following the lead of Gray and Schlegel, writers on birds from the East Indies have generally called this Tern *H. nigra*, but the true Black Tern of Europe does not, according to Mr. Saunders, range east beyond Turkestan and Abyssinia. From the latter species, *H. leucoptera*, which Naumann considered the most beautiful of all the Terns, may be distinguished when adult by its white lesser and metacarpal wing-coverts, blackish red bill, white tail, which is very little forked, by its smaller size, but larger feet, which are scarlet in colour and less webbed than in *H. nigra*. *H. hybrida* may be distinguished from *H. leucoptera* at all times by its larger size and grey (not white) tail, which is not almost square but forked to a depth of 15—20 mm, and in the breeding season its cheeks and throat are grey, and a white stripe passes across the face.

381. HYDROCHELIDON HYBRIDA (Pall.).

Whiskered Tern.

a. **Sterna hybrida** *(1)* Pall., Zoogr. Rosso-Asiat. 1811, II, 338; *(2)* Schl., Mus. P.-B., Sternae, 1863, 32; *(3)* Rosenb., Malay. Archip. 1878, 279; *(4)* Oates, ed. Hume's Nests & Eggs 1890, III, 305.

b. **Sterna leucopareia** *(1)* Natterer in Temm. Man. d'Orn. 1820, 746; *(II)* Naum., Vög. Deutschl. 1840, X, 168, t. 255.

c. **Sterna javanica** *(1)* Horsf., Tr. L. Soc. 1821, XIII, 198 (the species in Horsfield's Zool. Res. in Java is *S. melanogaster* T., fide Saunders).

Hydrochelidon hybrida *(1)* Bp., Cat. Ucc. Eur. 1842, 77; *(2)* Swinh., P. Z. S. 1871, 421; *(3)* Salvad., Ucc. Borneo 1874, 372; *(IV)* Dress., B. Eur. 1877, VIII, 315, pls. 588, 589; *(5)* David & Oust., Ois. Chine 1877, 524; *(6)* Tweedd., P. Z. S. 1877, 536, 551; *(7)* Hume & Davis., Str. F. 1878, VI, 491; *(8)* Legge, B. Ceylon 1880, 996; *(9)* W. Rams., Tweedd. Orn. Works, Index 1881, 660; *(10)* Salvadori, Orn. Pap. 1882, III, 427, 566; *(11)* Vorderm., N. T. Ned. Ind. 1882, XLII, 126; *(12)* Oates, B. Br. Burmah 1883, II, 419; *(13)* Seeb., Ibis 1884, 270; *(14)* W. Blas., Z. ges. Orn. 1886, 204; *(15)* Sharpe, Ibis 1888, 204; *(16)* Rams., Tab. List 1888, 23; *(17)* North, Nests & Eggs B. Austr. 1889, 353, 402; *(18)* Everett, J. Str. Br. R. A. S. 1889, 210; *(19)* Radde & Walter, Ornis 1889, 127; *(20)* Whitehead, Ibis 1890, 61; *(21)* Styan, Ibis 1891, 331, 509; *(22)* De La Touche, Ibis 1892, 502; *(23)* Büttik., Zool. Erg. Weber's Reise 1893, III, 285; *(24)* Bns. & Worces., B. Menage Exp. 1894, 30; *(25)* Saund., Cat. B. 1896, XXV, 10; *(26)* Grant, Ibis 1896, 127.

d. **Hydrochelidon fluviatilis** *(1)* Gld., P. Z. S. 1842, 140; *(II)* id., B. Austr. 1848, VII, pl. 31.

e. **Hydrochelidon indica** (Steph.); *(1)* Gray, Gen. B. (1846) III, 660.

f. **Hydrochelidon leucopareia** *(1)* Gld., Hb. B. Austr. 1865, II, 406; *(2)* Wald., Tr. Z. S. 1872, VIII, 103; *(3)* id., ib. 1875, IX, 244; *(4)* Meyer, Ibis 1879, 146.

For further synonymy and references cf. Salvadori *10*; Saunders *25*.

Figures and descriptions. Naumann *b II*; Dresser *IV*, and the other standard works on European birds; Gould *d II*; Legge *8*; Saunders *25*; etc.

Breeding plumage. Top and sides of head nearly down to the level of the under eyelid, and nape black; from rictal region and chin to sides of upper neck white; general colour of remaining plumage grey, pale on cheeks and upper throat, darkest — blackish grey on lower breast and abdomen, velvety pearl-grey on primaries and their coverts, the worn tips of the former blackish; under wing-coverts, crissum and under tail-coverts white. Wing 243 mm; tail 85; tarsus 22; middle toe with claw 31; exposed culmen 31 mm (S. Europe, Nr. 10958).

Bill bright blood-red; iris deep hazel or dark brown; eyelid black; feet blood-red, lighter than the bill (Naumann *b II*).

Old male. The old male in the breeding season has the breast much darker than the female, but males in their second year are liable to be mistaken for females several years old (Naumann *b II*).

Winter plumage. In winter the entire under parts are white; forehead white, rest of head above and nape streaked with black and white. "Bill (variable) blackish red, dull red, almost black in some; legs and feet likewise varying from dark reddish to dull lake".

Eggs. "Moderately broad ovals, a good deal pointed towards one end. The texture is very fine and close but they have little or no gloss. The ground-colour varies, and is sometimes a pale olive stone-colour, sometimes an olive-brown, sometimes a bright decided green, or a rich or pale blue-green, sometimes a greenish grey, but most commonly a pale clear olive-green. The markings, which are generally pretty numerous, consist of streaks, spots and blotches of deep blackish brown, umber-brown, or reddish brown, and of a number of very pale purplish brown clouds, streaks, and spots underlying the primary markings." Mr. Hume describes some of the more pronounced types of markings. Size 35—42 × 26—29 mm (Hume *a 4*). See, also, North *17*, Naumann *b II*, etc.).

Nest. Of rushes, weeds, grasses, placed on hillocks of mud, or, on heaps of rush, reed or other rubbish driven together by the wind, on the leaves of the water-lily or lotos (India), the locality chosen being a large swamp or jheel (*b II*, *a 4*).

Distribution. "South-western, Central, and Southern Europe in summer and to about 55° N. lat. on migration; eastward throughout temperate and warmer Asia to China; southwards by Malayasia to Australia as far as 35° S. lat., throughout Africa; Barbados once" (Saunders *25*). — In the East Indies: Philippines — Luzon (Meyer *f 3*, Murray etc. *6*, *24*, *25*, *26*), Samar, Mindanao, Sulu, Tawi Tawi, Calamianes, Tablas, Romblon, Sibuyan, Panay, Guimaras, Negros, Masbate, Cebu, Siquijor (Bourns & Worcester *24*), Palawan (Whitehead *15*, *20*, Moseley *25*); Borneo (Diard, Schwaner, etc. *a 2*, *3*, *18*); Java (Horsfield *c 1*, Vorderman *11*); Celebes — Gorontalo Distr. (Forsten *a 2*, Riedel *14*), Togian (Meyer *f 4*, *25*), S. Peninsula, Tempe (Weber *23*); Buru (Bruijn *10*); ? Amboina (Platen *10*); Salawatti (Bruijn *10*); New Guinea (D'Albertis *10*).

No naturalist travelling in Celebes has paid close attention to the sea-birds of the island, and specimens of such are rather rare in collections. Of the Whiskered Tern over a dozen have been recorded from Celebes, from which it

would appear that the species is not rare. We suppose it to be a resident, as a number of specimens were collected by Meyer at the Togian Islands in August, and the bird breeds in India — except the Central and Southern parts of the country, — and in Australia. Mr. Saunders makes mention of some appreciable racial differences in this species; these are: slightly smaller size in India, a darker hue in the resident birds of S. Africa, a tendency to paler tints in Australia.

The members of the genus *Hydrochelidon* may be distinguished from the other Terns by their toes being only slightly webbed — not more so, in fact, than in such a bird as *Phalaropus*, and Naumann remarks of the present species that it is hardly ever to be seen swimming, and, even then, there is no forward paddling, as the bird simply rests a little upon the water. The web connecting the outer toe, which is the larger web, is indented almost as far down as the distal end of the first joint of the middle toe, the other web is considerably shorter. Four species of *Hydrochelidon* are admitted by Mr. Saunders (Catalogue of Birds 1896, XXV, *Gaviae*). The Whiskered Tern may be distinguished from its three allies in winter by its larger size, further from *H. leucoptera* by its grey tail forked to a depth of about 2 cm, and from *H. nigra* by its larger feet. The fourth species is the American form of *H. nigra*, *H. surinamensis*. In its summer plumage *H. hybrida* is very different from them. As Naumann remarks, this species by its size, form, colour, markings and to some extent even in its habits stands midway between the Common Tern, *Sterna hirundo* and *H. nigra*.

GENUS STERNA L.

In the true Terns the feet are somewhat small, with the anterior toes webbed not quite to their ends, the middle toe and claw longer than, or equal to, the tarsus; the tail forked, more or less deeply; the wing long, more than twice the length of the secondaries; the first primary the longest; more or less of the head black in the breeding season, in one species this colour being reduced to a black transocular streak. Food: fish, caught by plunging.

Mr. H. Saunders (1896) describes 33 species, of cosmopolitan distribution.

382. STERNA MEDIA Horsf.

Lesser Yellow-billed Tern.

Sterna media *(1)* Horsf., Tr. L. Soc. 1821, XIII, 199; *(2)* Finsch & Hartl., Vög. Ost-Afr. 1870, 830; *(3)* Heuglin, Orn. N.-O. Afr. 1871, 1430; *(4)* Salvad., Cat. Ucc. Borneo 1874, 377; *(5)* Saund., P. Z. S. 1876, 655; *(VI)* Dress., B. Europe VIII, 285, pl. 583 (1878); *(7)* Legge, B. Ceylon 1880, 1030; *(8)* Salvad., Orn. Pap. 1882, III, 437; *(9)* W. Blas., J. f. O. 1883, 129, 140; *(10)* Oates, B. Br. Burmah 1883, II, 426; *(11)* Rams., Tab. List 1888, 23; *(12)* Oates ed. Hume Nests & Eggs Ind. B. 1890, III, 299; *(13)* Salv., Orn. Pap. Agg. 1891, 211; *(14)* König, J. f. O.

1883, 96; *(15)* Barnes, Ibis 1893, 178; *(16)* Kuschel, J. f. O. 1895, 83; *(17)* Saund., Cat. B. 1896, XXV, 86.

a. **Sterna affinis** *(I)* Cretzschm. in Rüpp. Atlas p. 23, t. 14 (1826); *(2)* König-Warth., Ibis 1860, 127, pl. V (eggs); *(3)* Schl., Mus. P.-B., Sternae, 1863, 6; *(4)* Finsch, Neu Guinea 1865, 184; *(5)* Hartl., Vög. Madag. 1877, 383; *(6)* Rosenb., Malay. Archip. 1878, 279; *(7)* id., Zool. Garten 1881, 168.

b. **Sterna bengalensis** *(1)* Less., Tr. d'Orn. 1831, 621.

c. **Thalasseus torresii** *(1)* Gld., P. Z. S. 1842, 140; *(II)* id., B. Austr. 1848, VII, pl. 25.

d. **Pelecanopus medius** *(1)* Wald., Tr. Z. S. 1872, VIII, 104; *(2)* Meyer, Ibis 1879, 145.

For further synonymy and references cf. Finsch & Hartlaub *2*; Heuglin *3*; Salvadori *8*; H. Saunders *17*.

Figures and descriptions. Gould *c II*; Dresser *VI*; Heuglin *3*; Legge *7*; etc.

Breeding plumage. Head above down to the level of the lower eyelid, and nape black, the nuchal feathers lengthened into a short crest; loral region, face, neck, and entire under parts white; upper parts grey, the greater wing-coverts tipped with white, the primaries frosted with pearl-grey, tail deeply forked — to a depth of 50 mm or more.

"Iris brown; bill orange-yellow; legs and feet black, soles of toes yellowish" (Legge *7*).

Winter plumage. Like that of summer, except that the forehead is all white, and the crown white streaked with black; nape and a mark in front of the eye black (Nr. 11829).

Measurements. Wing 255 mm; tail c. 100—150; tarsus 28; middle toe with claw 25; exp. culmen 50.

Eggs. 2 or 3. "There are two principal varieties with respect to coloration: (A) white or greenish white with coarse spots, sometimes scattered, sometimes arranged in groups. The centre of each spot is violet-grey or blackish grey, which colour passes into a beautiful chestnut-brown and dark brown towards the periphery; the edges are generally burnt brown . . . (B) Yellowish, sometimes with a reddish shade, dotted and striolated, the darkest points, dots, and streaks are black-brown or brownish red; the margins of the spots shining brown or red" (v. König-Warthausen *a 2*, with plate; see, also, Heuglin *3*, Hume *12*, Barnes *15*).

Nest. On slightly raised sandy flats, covered with Madrepore-remains, not far from the water's edge, in places where only a scanty vegetation of soda plants exists . . . numerous nests often rather crowded together (Red Sea: Heuglin *3*).

Distribution. "Mediterranean, from Straits of Gibraltar (sparingly) eastwards to Egypt; Red Sea; East Africa to Madagascar and islands of Indian Ocean, Persian Gulf, Arabian Sea, Lower Bay of Bengal, Malacca, Sumatra, Java, and Celebes; Aru and Yule Id. *(8)*; Australia, chiefly the north" (Saunders *17*).

In Celebes: — Macassar (S. Müller *a 3*); N. Celebes (Forsten *a 3*); Strait of Lembeh (Meyer *d 2*); Lake Limbotto (Rosenberg *a 7*).

Among the few species of Tern known from Celebes the present species is most like *S. bergii*, but is much smaller, darker grey on the upper parts, and in the summer the black of the head reaches to the base of the upper bill. Both species have the nuchal feathers so lengthened as to form a sort of crest. The legs are black, the toes short and fully webbed. The Roseate Tern, *Sterna dougalli* Mont., which will probably be found in Celebes some day, since it is known from the Moluccas and Australia as well as from the Indian countries,

has red legs and a black, or mostly black, bill, and the rectrices are white, the outermost greatly prolonged in the adult. *S. longipennis* Nordm., which for the same reasons may be expected in Celebes, has black legs and bill, and a white deeply forked tail. The nearest ally of *S. media* is probably *S. eurygnatha* Saund, which has a white tail and the legs partly yellowish.

The habits of *S. media* are well described by Legge *(7)* and Heuglin *(3)*.

383. STERNA BERGII Lcht.

Greater Yellow-billed Tern.

Sterna bergii *(1)* Licht., Verz. Doubl. Berl. Mus. 1823, 80; *(2)* Schl., Mus. P.-B., Sternae, 1863, 11; *(3)* Finsch & Hartl., Orn. Centralpolyn. 1867, 216; *(4)* Heuglin, Orn. N.-O. Afr. 1871, 1436; *(5)* Hume, Str. F. 1873, I, 283; *(6)* id., ib. 1876, IV, 470; *(7)* Saund., P. Z. S. 1876, 657; *(8)* Butler, Str. F. 1877, V, 300; *(9)* Sharpe, Tr. L. Soc. 1877, (2) I, 350; *(10)* Hume & Davis., Str. F. 1878, VI, 493; *(11)* Legge, B. Ceylon 1880, 1026; *(12)* W. Ramsay, Tweedd. Orn. Works, Index 1881, 660; *(13)* Kelh., Ibis 1882, 201; *(14)* Salvad., Orn. Pap. 1882, III, 432; *(15)* W. Blas. & Nehrk., Verh. z.-b. Ges. Wien 1882, 434; *(16)* Oates, B. Br. Burmah 1883, II, 428; *(17)* Meyer, Isis, Dresden 1884, 57; *(18)* W. Blas., Z. ges. Orn. 1886, 172; *(19)* Stejn., Pr. U. S. Nat. Mus. 1887, X, 392; *(20)* Rams., Tab. List 1888, 23; *(21)* W. Blas., Orn. 1888, 320; *(22)* Sharpe, Ibis 1888, 204; *(23)* North, Nests & Eggs B. Austr. 1889, 354, pl. XIX, f. 2 (egg); *(24)* Everett, J. Str. Br. R. A. S. 1889, 210; *(25)* Whitehd., Ibis 1890, 60; *(26)* Sharpe, t. c. 149, 285; *(27)* Steere, List Coll. B. & M. Philipp. Is. 1890, 27; *(28)* Oates ed. Hume's Nests & Eggs Ind. B. 1890, III, 297; *(29)* Seeb., B. Japan 1890, 229; *(30)* Salvad., Agg. Orn. Pap. 1891, 211; *(30bis)* id., Ann. Mus. Civ. Gen. 1890, XXIX, 591, ib. 1891, XXX, 833; *(31)* Wiglesw., Av. Polyn. 1892, 74; *(32)* Büttik., Zool. Erg. Weber's Reise 1893, III, 285; *(33)* Bns. & Worces., B. Menage Exp. 1894, 31; *(34)* M. & Wg., J. f. O. 1894, 253; *(35)* iid., Abh. Mus. Dresd. 1895, Nr. 8, p. 20; *(36)* W. E. Clarke, Ibis 1895, 479; *(37)* Vorderm., N. T. Ned. Ind. 1895, LIV, 325; *(38)* Saund., Cat. B. 1896, XXV, 89; *(39)* Salvadori, Ann. Mus. Civ. Gen. 1896, XXXVI, 120; *(40)* Hartert, Nov. Zool. 1896, 250.

a. **Sterna cristata** *(1)* Steph. (nec Sws.), in Shaw's Gen. Zool. XIII (1), 146 (1826); *(2)* Swinh., Ibis 1863, 430; *(3)* Salvad., Cat. Ucc. Borneo 1874, 376.

b. **Sterna velox** *(1)* Cretzschm. in Rüpp. Atlas 1826, 21, t. 13; *(2)* König-Warth., Ibis 1860, 127, pl. V (eggs).

c. **Sterna pelecanoides** *(1)* King, Survey Int. Austr. 1826, II, 422; *(2)* Schl., Mus. P.-B., Sternae, 1863, 9; *(3)* Rosenb., Malay. Archip. 1878, 279; *(4)* Ribbe, Jb. Ver. Erdk. Dresd. 1892, 174.

d. **Thalasseus pelecanoides** *(1)* Gould, B. Austr. 1848, VII, pl. 23.

e. **Thalasseus poliocercus** Gould; *(1)* id., B. Austr. 1848, VII, pl. 24.

"Manuana", Kabruang, Talaut, Nat. Coll.

"Ngeo", general name for the Terns [Gorontalo], Rosenberg *c 3*.

For further synonymy and references cf. Finsch & Hartlaub *3*; Heuglin *4*; Salvadori *14, 30*; Saunders *38*.

Figures and descriptions. Gould *d 1, e 1*; Cretzschmar *b 1*; Schlegel *2, c 2*; Finsch & Hartlaub *3*; Heuglin *4*; Legge *11*; Saunders *38*; etc. etc.

Adult in winter plumage. Forehead, face, entire neck and under parts, including wing below, white; feathers of crown tipped with black, becoming all black on the occiput and nape, where the feathers are very long; a blackish spot in front of eye; back, wings, and tail grey, frosted with pearl-grey on exposed ends and outer webs of the primaries, the inner webs blackish grey, with a white space down the middle towards the base; tips of the greater wing-coverts and inner edges of the remiges white; tail deeply forked (to about 9 cm), the outermost rectrices very narrow (Manado: v. Musschenbroek — C 5274).

Adult in summer plumage. The crown, but not the forehead, is black like the occiput and nape.

"Iris dark brown; bill murky yellow, tinged with green in parts; roof of mouth and tongue bluish; legs and feet black, with a reddish tinge, soles yellowish" (Legge *11*).

Young — moulting (in second plumage on the head). Forehead white, rest of head above with black centres to the feathers; the grey feathers of the back with pale tips, upper tail-coverts whitish; remiges more broadly edged with white than in the adult; greater wing-coverts tipped with white, middle series white, the outer webs with a dusky mark, forming an ill-defined bar (Talaut, Nov. 1893: Nat. Coll. — C 13030).

Nestling. See, Saunders *38*.

Measurements (4 expls. Celebes area). Wing 315—330 mm; tail c. 155; tarsus c. 28; middle toe and claw c. 32; exp. culmen 48—55 mm.

Eggs. "The eggs are very handsome. The ground-colour is a saturated grey-yellow, with a reddish hue. Distributed over the whole of the eggs are sharply defined black and grey-brown hieroglyphics, blotches, and dots, which in some eggs are gathered into a circlet around the blunt end. The measurements are: 60—64 × 40—45 mm" (Nehrkorn MS). See, also, v. König-Warthausen *b 2*, with figures; North *23*, figure; Hume *6*, *28*.

Nest. None — "the eggs are laid on the bare ground in the most open and exposed parts of the island [of Astola in the Gulf of Oman] about one foot apart, and when sitting the birds seem packed together as close as possible, without perhaps actually touching each other" (Butler *8*). Colonel Butler observed the daring manner in which the eggs of these Terns are seized and devoured by Gulls *(Larus hemprichi)*, and remarks that it seems evident that the birds lay in groups to protect their eggs from such ravages. On islets in the Red Sea between Suakin and Massowa, Heuglin found the species breeding on rubbish and sand above high-water mark, between soda plants and low shrubs, the birds not rarely sitting in close proximity to one another *(4)*.

Distribution. The coasts of South, West, and East Africa, of South Asia to Japan; the East India Archipelago; Australia and Tasmania; throughout Polynesia (but not New Zealand); Hawaiian Islands. — In the Celebesian area: Talaut Islands, Kabruang (Nat. Coll. *34*); Celebes — (Forsten), Minahassa (Meyer and Musschenbroek in Dresd. Mus., P. & F. Sarasin *35*), Gorontalo Distr. (Riedel in Brunsw. Mus. *18*, and Dresd. Mus.), S. Peninsula, Macassar and Goa (Weber *32*).

The Larger Yellow-billed Tern appears to be a resident in Celebes. It was most likely this Tern, rather than *S. media*, that Meyer found breeding in large flocks on the rocks in the Strait of Lembeh, N. E. Celebes, for a specimen from there, previously determined as *S. media*, proves to be this bird. It is distinguishable from *S. media* by its larger size, the grey of the upper parts is lighter, and in the breeding season the forehead remains white.

Three or four species have been made of the bird which we, following Finsch & Hartlaub, Heuglin, Salvadori, and Saunders, regard as one species which ranges from Australia to Japan and round the coasts washed by the Indian Ocean to South-west Africa. But it varies locally to a considerable extent. "As regards size", writes Mr. H. Saunders, "the smallest are those from the south of Australia. . . . In North Australia birds are nearly as large as those from the Red Sea and Mekran coasts, and there is every gradation over the area frequented. In colour, the birds with the darkest upper parts are those from the Red (*"S. velox"*) and Arabian Seas and the Bay of Bengal, and these dark birds — slightly falling off in size — run down to the northern part of Australia (*"S. pelecanoides"*). There and in the Moluccas they meet and blend with the smaller southern race (*"S. poliocercus"*) from which they gradually become indistinguishable. In birds from South Africa and the Mascarene Islands the size of the Indian form is maintained, but the tint of the upper parts is of a purer grey without the brownish tinge, and this also holds good of most of the Polynesian examples, though the latter show a slight diminution in size". As the probable chief cause of these differences in tint, Mr. H. Saunders suggests the influence of the sun: "Under the hot sun of the Arabian and Indian Seas the grey feathers of the mantle and tail soon acquire a brownish tinge at their edges, and brown is a very assertive colour; whereas in the Southern Seas and in the Pacific the sun's direct force is much feebler". But in his admirable catalogue (p. 14) in the case of another species, the Whiskered Tern, Mr. Saunders shows that Northern African examples do not attain to the dark hue sometimes met with in resident examples from the cooler area of South Africa; and Indian birds are slightly smaller in size, not among the largest.

This species is a true Sea Tern. It breeds in large colonies, one of the most celebrated being that on the island of Astolah in the Gulf of Oman, made known in a highly interesting manner by the observations of Mr. Hume (*6, 28*) and Colonel Butler (*8*). About 7000 eggs of this species were brought away by some fishermen in June, 1878. Here the birds, as Butler found, suffer from the depredations of a Gull; on Oyster Island near Akyab Captain Shopland observed that they had a great enemy to their breeding in the Hermit-crab, which was always ready, when opportunity offered, to seize their eggs (*28*).

384. STERNA SINENSIS Gm.

White-shafted Little Tern.

Sterna sinensis (*1*) Gm., S. N. 1788, I, 608 (ex Latham); (*2*) Saund., P. Z. S. 1876, 662; (*3*) Hume, Str. F. 1877, V, 325; (*4*) Legge, B. Ceylon 1880, 1019; (*5*) Oates, B. Br. Burmah 1883, II, 430; (*6*) Everett, J. Str. Br. R. A. S. 1889, 211; (*7*) Whitehd., Ibis 1890, 60; (*8*) Oates ed. Hume's Nests & Eggs Ind. B. 1890, III, 312; (*9*) Seebohm, B. Japan 1890, 298; (*10*) Styan, Ibis 1891, 331, 509;

(11) Bns. & Worces., B. Menage Exped. 1894, 31; *(12)* Saund., Cat. B. 1896, XXV, 113.

a. **Sterna pusilla** *(1)* Temm., Man. d'Orn. 2nd ed. 1840, pt. 4, 465.

b. **Sternula sinensis** *(1)* Boie, Isis 1844, 183; *(2)* David & Oust., Ois. Chine 1877, 527; *(3)* A. Müll., J. f. O. 1882, 438; *(4)* Salvad., Orn. Pap. 1882, III, 445; *(5)* Rams., Tab. List 1888, 23; *(6)* North, Nests & Eggs B. Austr. App. 1890, 405; *(7)* Salvad., Agg. Orn. Pap. 1891, 212; *(8)* Meyer, Abh. Mus. Dresden 1891, Nr. 4, p. 17; *(9)* De La Touche, Ibis 1892, 503; *(10)* Tacz., Faun. Orn. Sib. Orient. 1893, II, 1014; *(11)* Salvad., Boll. Mus. Torino 1896, XI, Nr. 250, 14.

c. **Sterna minuta** (nec Linn.); *(1)* Schl., Mus. P.-B., Sternae, 1863, 22, partim; *(2)* Rosenb., Malay. Archip. 1878, 279; *(3)* Steere, List Coll. B. & M. Philipp. 1890, 27.

d. **Sternula placens** *(1)* Gould, Ann. Mag. N. H. 1871, VIII, 192; *(II)* id., B. New Guinea 1876, V, pl. 72.

e. **Sternula minuta** (nec Linn.); *(1)* Wald., Tr. Z. S. 1872, VIII, 118; *(2)* Meyer, J. f. O. 1873, 405; *(3)* id., Ibis 1879, 145.

For further synonymy and references cf. Salvadori *b 4*, *b 7*; H. Saunders *12*.

Figures and descriptions. Gould *d II*; Seebohm *9*, woodcut of head; Legge *4*; Salvadori *b 4*; Oates *5*; Taczanowski *b 10*; H. Saunders *12*.

Breeding plumage. Crown, occiput, nape, and a band from the eye to the base of the bill uniform black; forehead white, extending as a stripe to over the eye; upper parts light grey, pearl-grey on neck, primaries frosted with pearl-grey, all the shafts above, as well as below, white; secondaries tipped with whitish; tail and upper tail-coverts nearly white; chin, face, and under parts, including under wing-coverts und tail below white; primaries below greyish dusky, whitish on inner portion of inner webs; wing 180 mm; tail 95; depth of fork about 48; tarsus 18.5; middle toe and claw 17; exposed culmen 30 (Japan — C 11337).

"Iris hazel-brown; bill gamboge-yellow, sometimes without a dark tip, but generally with more or less of the tips of both mandibles, for a distance of 8.9 mm, black; legs and feet orange-yellow. In some females the legs are dusky orange" (Legge *4*).

Winter plumage. In winter the crown as well as the forehead is white; blackish in front of the eye.

Young. Above pale cinnamon-buff and grey, the feathers marked with subterminal U-shaped bars of dusky; nape and sides of occiput and spot in front of eye black; crown streaked with black and buff-brown; forehead whitish; under parts including tail white (New Britain: B. & H. Geisler — C 10164).

"Bill, lower mandible and edge of upper fleshy yellow, culmen and tip of lower mandible dusky; legs and feet dingy yellow" (Legge *4*).

Eggs. Resemble those of *S. minuta* of Europe with fine spots. The ground-colour is a pale clay-yellow, the spots and points smaller than those on eggs of the European species compared; the superficial ones of dark brown, the inferior of greyish brown are rather numerous and distributed over the whole surface, more numerously at the blunt end. Dimensions: 33 × 25 mm; 34 × 26; 38 × 23 (Ussuriland — Taczanowski *b 10*); see, also, Legge *4*; Hume *8*; North *b 6*.

Nest. A little hollow scratched out, lined with a few bits of grass-stalk, etc., on gravel, or shingle, or sand, on the shores of rivers or on islands therein, or in dried-up reservoirs, shores of lagoons, or of bays of the sea *(4, 8, b 9)*.

Distribution. S. E. Siberia, Ussuriland and Corea *(b 10)*; Japan and Loochoo Islands *(9)*; Formosa *(12)*; Hainan, China *(b 2, 10)*; Bay of Bengal, Ceylon, Burmah and Malacca

(4, 5, 12); Sumatra (fide Salvadori *b 11*); Java (Horsfield *b 4, 12*); Borneo (Schwaner, etc. *6, 12, c 1*); Philippines — Mindoro (Bourns & Worcester *11*), Palawan (Whitehead *7*), Mindanao (Steere *c 3*); Celebes — North (Meyer *e 1, e 2, e 3*); ? Timor (S. Müller *c 1*); New Guinea — S. coast (fide E. P. Ramsay *b 4, b 5*); New Britain (Finsch *b 4*, B. & H. Geisler *b 8*); Islands of Torres Straits (Gould, Masters *d II, b 4, 12*); Australia — Northern and Eastern (Ramsay, etc. *b 5, b 6, 12*).

The Oriental form of the Little Tern was met with by Meyer in 1870—71, but has not since been obtained from Celebes, unless the two immature examples in the British Museum are from another source. Meyer obtained several adults, recorded by Lord Walden. Most probably it is only a winter visitor to Celebes. Mr. Whitehead *(7)* says it is a winter visitor to Palawan, arriving about the 20th September; Mr. Styan *(10)* notices it as a spring and autumn bird of passage on the Lower Yangtse, and Kalinowski *(b 10)* found it abundant in Corea in spring, rare in summer and absent in winter. Mr. De La Touche discovered it nesting in South China at Swatow in June; here it is a summer visitant. In Ceylon Legge found it to be most noticeable in the breeding season, but he is not prepared to say that most of the birds leave the island for the rest of the year. Mr. North has recorded its breeding in Australia, and it is clear from the young specimen in the Dresden Museum that it also nests in New Britain, but there seem to be no observations to show whether it is strictly stationary or not, south of the equator.

The White-shafted Little Tern is one of a group of closely allied forms, so closely allied in fact that we fear that the marks of distinction pointed out by Mr. Howard Saunders and others will hardly hold good for all cases; but of this we have no proof. *S. sinensis* is separable from *S. minuta*, which ranges from Europe and Africa to India and has occurred in Java, by the shafts of the primaries which are white, whereas in *S. minuta* the two or three outermost are brown above. *Sterna nereis* Gould of New Zealand, Australia and New Caledonia is also white-shafted, but it has only a spot of black in front of the eye, instead of a band reaching to the base of the bill. *S. saundersi* Hume, ranging from E. Africa to Burmah is described as black-shafted and with a straight culmen *(12)*. Other forms are found in America.

385. STERNA MELANAUCHEN Temm.

Black-filletted Tern.

Sterna melanauchen *(I)* Temm., Pl. Col. 1827, pl. 427; *(II)* Gould, B. Austr. 1848, VII, pl. 28; *(3)* Schl., Mus. P.-B., Sternae, 1863, 28; *(4)* Gould, Hb. B. Austr. 1865, II, 400; *(5)* Finsch, Neu Guinea 1865, 184; *(6)* Finsch & Hartl., Orn. Centralpolyn. 1867, 224; *(7)* Finsch, J. Mus. God. 1875, VIII, 41; *(8)* Saund., P. Z. S. 1876, 661; *(9)* David & Oustal., Ois. Chine 1877, 526; *(10)* Rosenb., Malay. Archip. 1878, 279; *(11)* Nehrk., J. f. O. 1879, 409; *(12)* Finsch, J. f. O. 1880, 295; *(13)* Lay., Ibis 1882, 540, 544; *(14)* Salvad., Orn. Pap. 1882, III, 443; *(15)* Oates, B. Br. Burmah 1883, II, 429, *(16)* W. Blasius, J. f. O. 1883, 127;

(17) Meyer, Ztschr. ges. Orn. 1884, 196; *(18)* W. Blasius, Ornis 1888, 320; *(19)* Rams., Tab. List 1888, 23; *(20)* Everett, J. Str. Br. R. A. S. 1889, 211; *(21)* North, Nests & Eggs B. Austr. 1889, 356; *(22)* Oates ed. Hume's Nests & Eggs Ind. B. 1890, III, 302; *(23)* Seeb., B. Japan 1890, 297; *(24)* Salvadori, Agg. Orn. Pap. 1891, 212; *(25)* Wiglesworth, Av. Polyn. 1892, 74; *(26)* De La Touche, Ibis 1892, 502; *(27)* Salvad., Ann. Mus. Gen. 1892, XXXII, 142; *(28)* M. & Wg., Abh. Mus. Dresd. 1895, Nr. 8, p. 20; *(29)* Saund., Cat. B. 1896, XXV, 126.

a. **Onychoprion melanauchen** *(1)* Wald., Tr. Z. S. 1872, VIII, 104.

b. **Sternula melanauchen** *(1)* Hume, Str. F. 1874, II, 319.

c. **Onychoprion sumatranus** [1]) ("Raffl."); *(1)* Salvadori, Cat. Uccelli Borneo 1874, 374; *(2)* Vorderm., N. T. Ned. Ind. 1884, XLIV, 253; *(3)* id., ib. 1892, LI, 415.

d. **Sterna sumatrana** *(1)* Hume & Davis., Str. F. 1878, VI, 493; *(2)* Kelh., Ibis 1882, 202.

For further synonymy and references cf. Finsch & Hartlaub *6*; Salvadori *14*, *24*; H. Saunders *29*.

Figures and descriptions. Temminck *I*; Gould *II*; Schlegel *3*; Finsch & Hartlaub *6*; Salvadori *14*; Oates *15*; Seebohm *23* (woodcut); H. Saunders *29*.

Adult. Head above, face, and under parts, including wing below, and tail, white; a black band through the eye (but not reaching to the base of the bill) round the nape (where it is broadest); upper parts very light grey; upper hind neck, tail-feathers, except the basal ones, and tips of secondaries, inner edges and shafts of primaries white; outer web of outermost primary black (Banka Id., N. Celebes, May, 1893: Nat. Coll. — C 12094).

The tail is forked to a depth of 8—9 cm.

Winter plumage. In winter, according to Mr. Howard Saunders *(29)*, the adult has less black in front of the eye and round the nape.

Iris dark brown; bill and legs black (Kelham *d 2*).

Young. Above impure cream-colour, the feathers crossed with subterminal U-shaped bars of dusky, bases pale grey, the head above with a few fine streaks of dusky; a band of black with paler tips to the feathers through eye round the nape; remiges grey, the tips and most of the inner webs cream-white or white, shafts white, outermost primary blacker; under parts cream-white; "iris dark; feet brownish; bill black" (juv., Lembeh Id., N. Celebes, 18. July, 1893: P. & F. Sarasin).

Measurements.

	Wing	Tail	Tarsus	Mid. toe and claw	Exposed culmen
a. (C 12095) ad., Banka Id., May, 1893 (Nat. Coll.)	223	—	19.5	23	35
b. (C 12094) ad., Banka Id., May, 1893 (Nat. Coll.)	228	146	18.5	23	33
c. (C 12093) ad., Banka Id., May, 1893 (Nat. Coll.)	235	156	20	24	37
d. (Sarasin Coll.) juv., Lembeh Id., 18. July, 1893	162	70	19	22	25

Eggs. 2. "Eggs from islands of all parts of the South Seas are similar. They have a grey-yellow ground, with violet shell-spots and light and dark brown surface-spots, which in most eggs are evenly distributed over the whole surface. They stand nearest to the eggs of *Sterna minuta*, but are notably larger and measure 38—41 × 27—29 mm" (Nehrkorn MS). See, also, Hume *b 1*, *22*; North *21*; Finsch *7*.

[1]) Raffles' species of this name is included by Mr. H. Saunders with a query in the synonymy of *S. sinensis*, by Salvadori doubtfully *(14)* in that of the present species. From the original description (Trans. Linn. Soc. 1822, XIII, 329) it is quite impossible to decide what the species may have been.

Nest. The eggs are laid upon a little collection of small lumps of coral and stone on the bare rock, or in a little depression in the sand (Andaman and Nicobar Is., Hume *22*).

Distribution. Indian and Pacific Oceans — from Tenasserim and the Andamans to the island-groups north of Madagascar; from the Loochoo Islands and E. and S. China through the East India Archipelago to New Guinea, New Caledonia and N. and E. Australia, west as far as the Marshall, Phoenix, and Samoa Islands in Polynesia. — In Celebes: Celebes (Reinwardt *3*); Banka Island (Nat. Coll.); Lembeh Island (P. & F. Sarasin).

The type of the Black-filletted Tern was obtained, apparently in 1821, by Reinwardt in Celebes, but not many examples have been collected there since. It breeds, however, at Lembeh Island, as is proved by the young example killed there by the cousins Sarasin; it looks as if it had not been more than a fortnight out of the nest. Other known breeding places are the Andamans and Nicobars, S. and E. China, the Pelew Islands, sandbanks off N. Australia, and various islands of Polynesia (eggs in the Nehrkorn Coll.). It is, however, to some extent also a migrant, for instance Abbé David *(9)* and Mr. De La Touche *(26)* observe that it comes to the rocky islets off the coast of China in great numbers in the warm season to breed; and similarly, as Hume and Davison *(b 1)* found, it visits the Andamans towards the end of April for this purpose.

This is a beautiful and very distinct species, easily recognised by its having the whole head above white encircled by a band of black passing through the eye and round the nape, by its light pearl-grey upper plumage with the outer web of the outer primary black, and black bill and feet. From the angular cut of its shorter remiges, which bear resemblance to those of the next species *S. anaestheta*, it is evidently an admirable flier. Its most special characteristic is the restriction of the black of the head to a broad fillet. In the *Sterninae* black is a very persistent colour over the forehead, crown and nape; in a large number of typical Terns the whole upper head, down to the level of the under eyelid and nape is black; white appears first (or black disappears first, as the case may be) on the forehead and supraloral region, as shown in many species, for instance *S. minuta*, *S. bergii*, *S. fuliginosa*; in *S. melanauchen* the black is restricted to a band round the head, in *S. trudeaui* of S. America the band no longer passes round the nape, but it remains as a stripe through the eye; in *Gygis* there is no black at all in the plumage. In a species of *Anous*, *Anous leucocapillus*, the entire state of things is reversed; the head above and nape are white and the rest of the bird black. In the true Terns it may be noted that the black on the head expands, so to say, in the breeding season and recedes in the winter; the young of many species of Terns also show a tendency to acquire black on the nape and on the region of the eye, but less so on the crown and not at all on the forehead. As a parallel case may be cited a group of Orioles: *Oriolus melanisticus* of Talaut, *O. broderipi*, *celebensis*, *galbula*, and others, in which the black on the head and nape forms (sometimes) an almost

complete hood in the first species, leaves a broad yellow forehead in the second, a black fillet, much as in *Sterna melanauchen*, in the third, and finally a simple loral stripe of black in *O. galbula*.

386. STERNA ANAESTHETA Scop.

Brown-winged Tern.

Sterna anaestheta[1]) *(1)* Scop., Del. Faun. et Flor. Insubr. 1786, I, 92; *(2)* Saund., P. Z. S. 1876, 664; *(3)* Legge, B. Ceylon 1880, 1040; *(4)* Oates, B. Br. Burmah 1883, II, 431; *(5)* Brd., Brew. & Ridgw., Water B. N. Am. 1884, II, 316; *(6)* Everett, J. Str. Br. R. A. S. 1889, 211; *(7)* North, Nests & Eggs B. Austr. 1889, 356; *(8)* Seeb., B. Japan 1890, 301; *(9)* Oates ed. Hume's Nests & Eggs Ind. B. 1890, III, 300; *(10)* Saund., Cat. B. 1896, XXV, 101.

a. **Sterna panayensis** *(1)* Gm., S. N. 1788, I, 607; *(2)* Schl., Mus. P.-B., Sternae, 1863, 26.

b. **Sterna panaya** *(1)* Lath., Ind. Orn. 1790, II, 808; *(2)* Finsch & Hartl., Orn. Centralpolyn. 1867, 228, t. IV, figs. 1, 2, 3 (eggs); *(3)* iid., Vög. Ost.-Afr. 1870, 833.

c. **Sterna melanoptera** *(1)* Sws., B. W. Afr. 1837, II, 249; ? *(2)* Rosenberg, Zool. Garten 1881, 167.

d. **Onychoprion panaya** *(1)* Gould, B. Aust. 1848, VII, pl. 33.

e. **Onychoprion anaesthetus** *(1)* Blyth, Cat. B. Mus. As. Soc. 1849, 293; *(2)* Wald., Tr. Z. S. 1872, VIII, 104; *(3)* Salvad., Cat. Ucc. Borneo 1874, 374; *(4)* Wald., Tr. Z. S. 1875, IX, 244, 252; *(5)* Salvad., Orn. Pap. 1882, III, 449; *(6)* W. Blas., Ornis 1888, 634; *(7)* Salvad., Agg. Orn. Pap. 1891, 212; *(8)* Wiglesw., Av. Polyn. 1892. 76; *(9)* Meyer, Abh. Mus. Dresd. 1893, Nr. 3, p. 29; *(10)* M. & Wg., ib. 1896, Nr. 1, p. 15.

f. **Haliplana anaestheta** *(1)* Swinh., P. Z. S. 1871, 422; *(2)* David & Oust., Ois. Chine 1877, 528.

g. **Hydrochelidon anaesthetus** *(1)* Heugl., Orn. N. O. Afr. 1871, 1453.

For further synonymy and references cf. Finsch & Hartlaub *b 2, b 3*; Salvadori *e 5, e 7*; H. Saunders *10*.

Figures and descriptions. Gould *d I*; Baird, Brewer & Ridgway *5*, woodcut of head; Seebohm *8*, woodcut of head; Finsch & Hartlaub *b 2, b 3*; Heuglin *g 1*; Legge *3*; Oates *4*; Salvadori *e 5*; H. Saunders *10*; etc.

Adult in winter plumage. Forehead and superciliary stripe white; crown black, with white tips and edges to the feathers; occiput and nape more uniform black; remaining upper parts hair-brown, remiges and lesser wing-coverts darker, palest on hind neck; from base of upper mandible to eye a band of black mixed with white; rest of face, entire under parts, edge of wing, and under wing-coverts white, with a cast of French grey on the body below; remiges and rectrices below dusky, paling into white towards their bases, shafts white, tail forked to a depth of about 10 cm (♂, Constantinhafen, New Guinea: Kubary — C 9952).

"Iris brown; bill and feet black" (Platen *e 6*).

Breeding plumage. In breeding plumage the bird has the crown, occiput, and nape, and the band from the base of the bill through the eye to the sides of the occiput uniform black, forehead and superciliary stripe white.

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[1]) Variously spelt *anaethetus, anaestheta, anostheta*.

Immature. Similar to the adult in winter plumage, but with the feathers of the upper parts tipped with whitish, and head above browner (♂, Bonthain, S. Celebes, 15. Jan. 1895: P. & F. Sarasin).

Young. "Head streaked and mottled with brownish black; feathers of the upper parts dark brown with rufous tips, which subsequently become paler, approaching white, and finally wear away; under parts greyish white; bill and toes brownish" (H. Saunders *10*).

Measurements. Wing 240—278 mm (the smallest being the above immature bird from Bonthain, the largest an exceptionally large example from Sangi measured by Prof. W. Blasius), tail c. 170, depth of fork c. 100; tarsus 22; middle toe with claw 29; exposed culmen c. 40—45.

Eggs. 1, sometimes 2. "The eggs have a white ground, violet shell-spots, and light and dark brown superjacent spots, some sharply defined, some washy. The variability is very great. Size 50—51 × 35—36 mm" (Nehrkorn MS); see, also, Finsch & Hartlaub *b 2*, with figures; Heuglin *b 3*; Baird, Brewer & Ridgway *5*; North *7*; Hume *9*; etc.

Nest. None. The egg (or eggs) is laid in a depression in the sand near high-water mark, or among fragments of rock, or in clefts of the rocks, or in holes dug in the ground to a depth of 1 to 1½ feet, or under a tuft of grass, or under a small bush. Generally rather well concealed (*9*, *b 3*, *7*, etc.).

Distribution. From the Gulf of Mexico and the West Indies to W. Africa; the coasts washed by the Indian Ocean and its seas, including the East India Archipelago and Australia; the Western Pacific Ocean from Japan to the Phoenix and Tonga Islands (see H. Saunders *10*). — In the Celebesian area: Great Sangi Island (Platen *e 6*); Celebes — S. Peninsula at Bonthain (P. & F. Sarasin); Saleyer Island (Wallace *e 2*, *10*).

Up to the present time we know of only one example of this wide-ranging Tern from the mainland of Celebes, the immature male obtained by the cousins Sarasin in the South. There is an immature example from Saleyer from Mr. Wallace in the British Museum, and a male of unusually large size, as Prof. W. Blasius shows, from Great Sangi in the Brunswick Museum.

The Brown-winged Tern is easily distinguishable from the other Terns, breeding in or visiting Celebes, by its brown upper parts and white under surface. Its toes have the webs somewhat deeply indented, and in this respect it forms an approach to the genus *Hydrochelidon*, as it does also by its somewhat thin, sharply pointed bill and by its tendency to dusky hues; but its tail-feathers, lengthened laterally into rather long streamers, as well as its marine habits, serve to separate it from that genus. It has the wing of a bird of great flying powers — lengthened primaries, the inner ones with the ends somewhat angularly cut, and short secondaries, and Heuglin describes it as the predicate of a perfect flier; its movements in the air, even against strong breezes, are as active as strong, light, soft, and enduring. With two other species, *Sterna fuliginosa* Gm. inhabiting the warmer seas of the globe, and *S. lunata* Peale from some of the warmer parts of the Western Pacific, east to Hawaii and the Paumotu Islands, the present species has been placed in the genus *Onychoprion*, which has this peculiarity amongst others, of usually laying only a single egg;

but Mr. Howard Saunders remarks that with every desire to separate them generically, he is unable to find any structural differences which would warrant such a proceeding.

S. lunata may be recognised by its grey upper parts and the entirely pure white outer web of the outermost rectrices; *S. fuliginosa* is larger, has the upper surface blackish, and in summer the black stripe from the eye descends towards the gape instead of running horizontally towards the nostril as in *S. anaestheta*. Both *S. lunata* and *fuliginosa* are not unlikely to be found in Celebes.

GENUS ANOUS Steph.

The Noddy Terns are easily distinguishable from the other Terns by the shape of their tails and by their coloration. In *Anous* the tail of 12 feathers is more than half the length of the wing, graduated, the fourth pair of rectrices, counting from the outside, being the longest; its plumage is of a uniform sooty black or brown, with the head above grey in the typical forms. They range over the warmer seas, breeding in colonies and laying a single egg at a sitting. The nostril is situated rather far forward, the anterior margin reaching to the middle of the bill.

387. ANOUS STOLIDUS (L.).

Noddy Tern.

a. **Sterna stolida** *(I)* Kittl., Kupfertafeln 1833, III, 27, t. 36, f. 2; *(II)* Audub., B. N. Amer. 1844, VII, 123, pl. 440; *(3)* Schl., Mus. P.-B., Sternae, 1863, 36.

Anous stolidus *(1)* Gray, List Gen. B. 1841, 100; *(II)* Gould, B. Austr. 1848, VII, pl. 34; *(3)* Finsch & Hartl., Orn. Centralpolyn. 1867, 234; *(4)* Lenz, J. f. O. 1877, 381; *(5)* Legge, B. Ceylon 1880, 1043; *(6)* Salvad., Orn. Pap. 1882, III, 452; *(7)* Meyer, Isis, Dresden 1884, 6; *(8)* Brd., Brew. & Ridgw., Water B. N. Am. 1884, II, 325; *(9)* MacFarlane, Ibis 1887, 210, 211, 212, 213; *(10)* Finsch, Ornis, 1887, 372, R. Blasius, ib. 386, pl. II (eggs); *(11)* W. Blasius, Ornis 1888, 320, 636; *(12)* North, Nests & Eggs Austr. B. 1889, 358, 375, pl. XXI, f. 2 (egg); *(13)* Whitehd., Ibis 1890, 60; *(14)* J. B. Young, Ibis 1891, 146; *(15)* A. J. Campb., Ber. II. Orn. Congress Budapest 1893, 158, phot.; *(XVI)* Rothsch., Av. Laysan pt. I, 1893, 41, pl.; *(17)* Newton, Dict. B. 1894, 643; *(18)* M. & Wg., Abh. Mus. Dresden 1895, Nr. 8, p. 20; *(19)* Saund., Cat. B. 1896, XXV, 136.

For further synonymy and references cf. Salvadori *6*; H. Saunders *19*.

Figures and descriptions. Kittlitz *a I*; Audubon *a II*; Gould *II*; Rothschild *XVI*; Finsch & Hartlaub *3*; Legge *5*; Salvadori *6*; Baird, Brewer & Ridgway *8*; H. Saunders *19*; etc., etc.

Adult. Sepia brown, darkest on the primaries, paler below, with a leaden cast on neck, throat and chin, head above light silvery grey; loral region and ear-coverts blackish; under wing-coverts grey-brown; wing 271; tail c. 160; tarsus 23; middle toe with claw 35; exposed culmen 35 mm (ad., Manado, 15. April, 1893: Nat. Coll. — C 12105).

"Iris deep brown; bill black, orange at gape; legs and feet dusky vinous purple, webs paler; claws black" (Hume *5*).

Sexes. The sexes are very similar. Mr. Howard Saunders describes the female as being, as a rule, somewhat browner on the shoulders and with less lead-colour on the throat, slightly smaller and with a weaker bill *(19)*.

Young. Differs from the adult in being paler brown, the feathers of the back and the wing-coverts with paler edges; abdomen whity-brown; head above brown like the back, becoming grey on the forehead; superciliary and suborbital stripe white; loral region and above front of eye blackish brown; "feet brownish; bill black" (♂, Manado, 16. Nov. 1893: P. & F. Sarasin).

Eggs. Only one to a sitting. "The most usual variety found is of a creamy white ground-colour, with crowded spots and blotches of chestnut-red and faint bluish grey, the latter colouring appearing as if beneath the shell's surface; these markings are more thickly disposed towards the larger end of the egg, and in some specimens form an irregular zone"; size 50.2 × 35.3 mm (North *12*); see, also, Gould *II*; Baird, Brewer & Ridgway *8*; O. Finsch & R. Blasius *10*; etc. The yolk is yellow; in *Sterna fuliginosa* deep orange-reddish (Crowfoot, and Finsch *10*).

Nest. Of sea-weed, about 6 inches in diameter, 4—8 in. in height, so completely plastered with the excrement of the bird that at first sight they appear to be entirely formed of that material; placed on the ground in a clear open space, or on the tops of the thick scrub (Gilbert in Gould *II*: Houtmann's Abrolhos — see photograph of breeding grounds by A. J. Campbell *15*). In the South Seas Dr. Finsch found the Noddy always breeding in trees; the nests were roughly constructed of dry twigs on the leaves of cocoa-palms, by preference in a parasitic fern growing thereon. On the contrary at Diego Garcia in the Indian Ocean Dr. Finsch found the species breeding on the ground, though the open spot was surrounded by trees *(10)*. Interesting accounts of the breeding of this species have been given by many writers.

Distribution. The warmer parts of the Atlantic, Pacific, and Indian Oceans. — In the Celebes Province: — Sangi Islands (v. Bültzingslöwen *4*, *11*); N. Celebes (Nat. Coll., P. & F. Sarasin *18*).

Hitherto the Common Noddy had not been recorded from Celebes, and the adult from our native collectors and the young specimen from the Sarasins described are the only examples from the island with which we are acquainted.

This well-known species is easily distinguishable from the Terns by its dark smoke-brown plumage and grey cap, and structurally by the shape of the tail, which is graduated, the fourth pair of rectrices from the outside being the longest. Not taking into consideration the doubtful form, *Anous galapagensis* Sharpe, the Common Noddy finds its nearest relatives in the members of the genus *Micranous*, which Mr. H. Saunders separates by their longer and thinner bill, and the third pair of rectrices from the outside being the longest. *Micranous leucocapillus* Gld. and possibly *M. tenuirostris* Temm. may ultimately be found on the coasts of Celebes; the former may be recognised by its head which is white above, by its sooty black plumage and jet-black lores; the latter is like *A. stolidus*, but is distinguishable by its grey lores and black mark in front of and over the eye; both are also much smaller than *A. stolidus*.

Noddy, meaning stupid, is a sailors' name for this species, given on account of its being free from a wholesome dread of man. It has been known to

suffer itself to be taken by hand, and, when breeding, must often be pushed off the nest in order that its egg may be taken. Probably, like man, it knows when adult hardly any enemy in the animal kingdom, its most serious inconvenience, as with him, being a too rapid increase of population. Consequently it lays only one egg, but the returns from its nurseries seem to suffer great reduction from enemies to its eggs and young. At the Houtmann's Abrolhos off West Australia Gilbert found a small lizard which preyed upon the young (devouring only the brain and marrow) to such an extent that he expressed the conviction that not more than one in twenty of the birds hatched ever reach maturity; besides which great numbers of the old birds were constantly killed *(II)*.

GENUS STERCORARIUS Briss.

See description of family *Laridae*, p. 893.

388. STERCORARIUS sp.

In the "Natuurkundig Tijdschrift v. Ned. Indië" 1876, XXXVI, p. 379, van Musschenbroek records a species of *Stercorarius* as having been seen, but unfortunately not obtained, by him. Mr. H. Saunders (Cat. B. 1896, XXV, 326) records *S. pomatorhinus* (Temm.), which has a vast range chiefly in the Northern Hemisphere, both from Japan and from Cape York, Australia, so that its occurrence in Celebes seems probable. Under the name *S. hardyi*, *Stercorarius parasiticus* L. was recorded by Bonaparte (C. Av. 1856, II, 210) as having been captured between the Philippine and Sandwich Islands. Still more likely to occur in Celebes is *S. crepidatus* (Banks), a circumpolar species, ranging south to Australia and New Zealand. The two latter species according to Mr. H. Saunders, have the wing under 356 mm, but *S. pomatorhinus* above this length; *S. parasiticus* has only two outer primaries with white shafts, and the central rectrices longer than in *S. crepidatus*, sometimes projecting 230 mm.

ORDER TUBINARES.

The Petrels and Albatroses may always be distinguished from other seabirds by the shape of the nostrils, though some of them are extremely like Gulls or Skuas in external appearance. The nostrils take the form either of two short tubes on the sides of the maxilla (Albatros), or lie close together as tubes on the surface of the culmen, or are laterally united with a single orifice above the culmen. For further particulars see Salvin, Cat. B. 1896, XXV, 340—42; Gadow in Bronn's Kl. u. Ord. VI, 4, Aves 1893, II, 129; etc.

FAMILY PUFFINIDAE.

The Shearwaters and Fulmar Petrels are distinguished by Salvin from the other members of the *Tubinares* as follows: "Nostrils united externally, or nearly so, above the culmen; margin of the sternum uneven; distinct pterygoid processes; manubrium of furcula very short; coracoids short, wide at the base and divergent; 1st primary the longest, or not shorter than the second". The Fulmars are further marked off as a subfamily by their having the sides of the palate furnished with lamellae.

GENUS PUFFINUS Briss.

Bill much like that of a Frigate-bird *(Fregata)* — nearly straight with a terminal hook, but differing of course by the tubular nostrils on the dorsal surface of the maxilla; tarsus laterally compressed, reticulated, shorter than middle toe and claw; the outer toe about equal to the middle one; tail rounded or cuneate; wings moderate. Cosmopolitan.

389. PUFFINUS CUNEATUS Salv.

Snow's Wedge-tailed Shearwater.

Puffinus cuneatus *(1)* Salvin, Ibis 1888, 353; *(2)* Stejn., Pr. U. S. Nat. Mus. 1889, XII, 377; *(3)* Seeb., Ibis 1891, 191; *(4)* Wiglesw., Av. Polyn. 1892, 80; *(V)* Wilson, Av. Hawaii. pt. IV pl. (1893); *(6)* Salvin, Cat. B. 1896, XXV, 371.

a. **Puffinus knudseni** *(1)* Stejn., Pr. U. S. Nat. Mus. 1888, XI, 93.

b. **Puffinus chlororhynchus** (nec Less.); *(1)* M. & Wg., J. f. O. 1894, 116; *(2)* iid., Abh. Mus. Dresd. 1895, Nr. 8, p. 20.

Figure and descriptions. S. B. Wilson *V*; Salvin *1*, *6*; Stejneger *a 1*.

Immature. Above sepia-brown, darkest on lower back and lesser wing-coverts, greyer on hind neck, darker and duller brown on head above; mantle, scapulars, and greater wing-coverts with paler edgings; wings and tail blackish brown; submalar region, chin and under parts white with a shade of pearl-grey in it, sides of neck greyer; under tail-coverts sepia-brown; under wing-coverts white, varied with grey-brown; "iris dark brown; bill steel-blue, tip darker; feet and legs pale flesh-red"; wing 291 mm; tail 136, lateral rectrices 90; tarsus 48; middle toe with claw 56, outer toe about 2 mm shorter; exposed culmen (straight) 38 (♀, Kema, N. Celebes, 15. Sept. 1893: P. & F. Sarasin).

Adult. The adult answers well to the above description, but as the specimen described is manifestly changing to a greyer brown plumage (as shown by the presence of new and of more abraded feathers); the bird is evidently more smoky and less sepia-tinted when adult.

Nest and eggs. Mr. S. B. Wilson *(V)* draws attention to Dr. Finsch's observations on the breeding of a Shearwater, which seems to have been this species, in the Sandwich Islands, but the bird was only seen, and broken fragments only of its eggs obtained. Seebohm *(3)* records it as breeding abundantly on Sulphur Island, Bonin Group; an egg from there measured 63.5 × 42 mm.

Distribution. From North Celebes to the Sandwich Islands: — Kema, North Celebes (P. & F. Sarasin *b 1, b 2)*; Bonin Islands (Holst. *3, 6)*; Krusenstern Id., N. Pacific (H. J. Snow *1, 6)*; Sandwich Islands (Knudsen *a 1, 2, V)*.

A single specimen of a white-bellied Wedge-tailed Shearwater was obtained by the cousins Sarasin at the N. E. extremity of Celebes in September, 1893, and was identified by us with *P. chlororhynchus* Less., but now, after much uncertainty, we hold it to be Mr. Salvin's *P. cuneatus*. Ordinarily *Puffinus chlororhynchus* has the under surface sooty-brown and *P. cuneatus* white, and from Mr. Salvin's measurements it appears that the middle and outer toes of the former are equal in length, but in the latter the middle toe is given as about 3 mm the longer. A form of *P. chlororhynchus* has, however, been figured by Gould (as immature) with a very pale grey under surface, while Salvin describes one of the types of *P. cuneatus* as — compared with the other — "greyer beneath, especially over the breast, flanks, and lower abdomen". We hardly doubt that Salvin, the chief authority on the Petrels, is in the right in separating the two forms, but we have no idea how such specimens as these latter, which are not fully considered by him, may be distinguished from one another. We at first held the Sarasins' specimens for the pale form of *P. chlororhynchus*.

P. chlororhynchus, which is very likely to be found in Celebes, has the following synonymy, distribution, etc..

Puffinus chlororhynchus Less.

Gould's Wedge-tailed Shearwater.

Puffinus chlororhynchus *(1)* Lesson, Tr. d'Orn. 1831, 613; *(2)* E. Newt., Ibis 1861, 181; 1867, 359; *(3)* Rchw., J. f. O. 1877, 11; *(4)* Hartl. Vög. Madag. 1877, 369; *(5)* Legge, B. Ceylon 1880, 1054; *(VI)* Milne-E. & Gr., Ois. Madag. 1879, I, 680, pls. 297, 298 (1881); *(7)* Salvin, Ibis 1888, 342; *(8)* Buller, B. New Zeal. 2nd ed. 1888, II, 235; *(9)* Hutton, P. Z. S. 1893, 749; *(10)* Salvin, Cat. B. 1896, XXV, 372.

a. **Puffinus sphenurus** *(1)* Gould, Ann. & Mag. N. H. 1844, XIII, 365; *(II)* id., B. Austr. 1848, VII, pl. 58; *(3)* Finsch & Hartl., Orn. Centralpolyn. 1867, 245; *(4)* Salvad., Orn. Pap. 1882, III, 464; *(5)* Crowfoot, Ibis 1885, 268; *(6)* Rams., Tab. List 1888, 24, 38; *(7)* North, Nests and Eggs B. Austr. 1889, 377; *(8)* Salvad., Orn. Pap. Agg. 1891, 213; *(9)* id., Ann. Mus. Civ. Gen. 1896, XXXVI, 120.

b. **Thiellus chlororhynchos** *(1)* Bp., Compt. Rend. 1856, XLII, 769, Nr. 69; *(2)* Coues, Pr. Ac. Philad. 1864, 123, 142.

c. **Thiellus sphenurus** *(1)* Bp., l. c. Nr. 70; *(2)* Coues, Pr. Ac. Philad. 1864, 122, 142; *(3)* Gld., Hb. B. Austr. 1865, II, 466.

d. **Procellaria sphenura et chlororhyncha** *(1)* Schleg., Mus. P.-B., Procell., 1863, 25.

For further synonymy and references cf. Salvadori *a 4, a 8*; Salvin *10*.

Figures and descriptions. Gould *a II*; Milne-Edwards & Grandidier *VI*; Coues *b 2, c 2*; Finsch & Hartlaub *a 3*; Hartlaub *4*; Legge *5*; Salvadori *a 4*; Buller *8*; Salvin *10*; etc.

Adult. Like *P. cuneatus*, but the under surface sooty brown, not white, though paler than the upper parts.

Sexes. The sexes are similar in coloration (Salvin *12*).

Egg. One; when fresh snow-white, varying much in size and shape, true ovals, lengthened and swollen ovals predominating; size 60—62 × 40—42 mm (North *7*).

Nest. None. "This bird digs out a hole in the soft soil on the faces of the cliffs, also in the sand on flat ground. Some of the burrows are six feet and more in length. The bird also lays extensively on Philip Island in shallow recesses under overhanging boulders and in colonies, i. e. many may be found close together. On Norfolk Island its holes are always isolated and the burrows deep" (Crowfoot *a 5*; see, also, E. Newton *2*; Gould *a II*; Gräffe *3*; North *a 7*).

Distribution. From Loango *(3)* over the Indian Ocean south to Tasmania, east across the Pacific as far as the Society Islands and New Zealand.

390. PUFFINUS LEUCOMELAS (Temm.).

Streaked Shearwater.

a. **Procellaria leucomelas** *(I)* Temm., Pl. Col. 587 (1835); *(2)* Schl., Mus. P.-B., Proc., 1863, 24.
Puffinus leucomelas *(1)* Less., Compl. de Buff. Ois. 711 (1838); *(II)* Temm. & Schl., Faun. Japon., Aves 1850, 131, pl. 85; *(3)* Coues, Pr. Ac. Philad. 1864, 130, 144; *(4)* Wald., Tr. Z. S. 1875, IX, 243, 252; *(5)* Brügg., Abh. Ver. Bremen 1876, V, 98; *(6)* David & Oust., Ois. Chine 1877, 515; *(7)* Meyer, Ibis 1879, 144; *(8)* Sharpe, P. Z. S. 1881, 800; *(9)* Salvad., Orn. Pap. 1882, III, 461; *(10)* W. Blas., J. f. O. 1883, 120, 121; *(11)* Everett, J. Str. Br. R. A. S. 1889, 212; *(12)* Seeb., B. Japan 1890, 264; *(13)* Salvad., Agg. Orn. Pap. 1891, 213; *(14)* Meyer, J. f. O. 1892, 266; *(15)* Salv., Cat. B. 1896, XXV, 370.

For further synonymy and references cf. Salvadori *9*, Salvin *15*.

Figures and descriptions. Temminck *a I*; Temminck & Schlegel *II*; Seebohm *12*, woodcut of head; David & Oustalet *6*; Salvadori *9*; Salvin *15*; etc.

Description. Above dull sepia-brown, the feathers of the back, shoulders and wing-coverts with whitish edges; wings and tail darker brown, the concealed basal part of the feathers white; head, face, and neck white streaked with blackish brown, becoming almost uniform blackish brown on middle of occiput and on hind neck; entire under parts white; "feet, with claws, very pale rose-colour; bill blackish, passing into reddish on the sides of the mandibles, and into whitish towards the extremity of the upper mandible; iris deep olivaceous brown, around the pupil a circle of yellowish brown" (T. & S. *II*); wing 335 mm; tail 150, lateral rectrices 100; tarsus 50; middle toe with claw 64, outer ditto 62; exposed culmen (straight) 52 (Dorey, New Guinea, March, 1873: Meyer — Nr. 2193).

Nest and eggs. We are not aware that these have been described.

Distribution. Japan (Siebold *a I, II, a 2*, Pryer *12*, etc.); Corea (G. Stephen *15*); China (David *6*); Philippines — Luzon (Cuming *4, 15*); N. Borneo (Pryer *8, 11, 15*); N. Celebes (Rosenberg *5*, v. Musschenbroek ? *7*); Moluccas — Morty (Bernstein *a 2, 9*), Ternate (Bruijn *9*, Fischer *13*), ? Buru *(9)*, Amboina *(9)*; Papuasia — New Guinea (Meyer *9*, Beccari *9*, Geisler *14*), Duke of York Id. (Hübner *9*); N. E. Australia (Cockerell *15*).

An example of the Streaked Shearwater obtained by von Rosenberg in 1863—1864, probably on the Gorontalo coast, has been placed on record by

Brüggemann, and Mr. Büttikofer informs us that there are two specimens (♂ & ♀) of this species from the same traveller in the Leyden Museum. Musschenbroek informed Meyer *(7)* that he got a specimen of this species between Manado and Kwandang in the Minahassa, but he himself elsewhere (N. T. Ned. Ind. 1876, XXXVI, 379) speaks of a *Procellaria leucoptera*, and the name seems to relate to the same specimen; we cannot tell which species is really concerned in this case.

The Streaked Shearwater is a rather rare species, and but little is known of its habits. By its strongly graduated wedge tail it belongs to the same group as *P. cuneatus* and *chlororhynchus*, but it is easily recognised by its larger size and much larger bill, and by its face and fore part of head being white, streaked with blackish.

"Procellaria leucoptera" van Musschenbroek, N. T. Ned. Ind. 1876, XXXVI, 379. As is mentioned above, Musschenbroek under this name mentions a bird obtained by him in Celebes, which seems to be the same as that recorded by Meyer after his information as *Puffinus leucomelas* (Ibis 1879, 145). Musschenbroek announced that he was bringing an example to Europe. We do not know whether this specimen still exists or not, but Mr. Büttikofer states *(in lit.)* that there is neither *Proc. leucoptera* nor *Puffinus leucomelas* from v. Musschenbroek in the Leyden Museum. Schlegel has recorded a *Procellaria leucoptera* from Ternate, but Mr. Salvin includes this in the synonymy of his *P. heraldica* of Chesterfield Is., W. Pacific Ocean. Its occurrence in Celebes appears highly probable, but there is at present no satisfactory evidence that it has ever been found there.

FAMILY DIOMEDEIDAE.

GENUS DIOMEDEA L.

391. DIOMEDEA sp.

Albatros sp.

? **"Diomedea brachyura"** van Musschenbroek, N. T. Ned. Ind. 1876, XXXVI, 379.

Musschenbroek here announces that he shot an Albatros in Celebes, but afterwards lost the skin. Such birds are of course very likely to appear occasionally off the coast of Celebes. From the distribution of the species given in Mr. Salvin's catalogue (Cat. B. 1896, XXV, 440—448) it would appear that *D. albatrus* Pall., *D. exulans* L. and *D. nigripes* Aud. are the species more likely to occur there than the others; of these *D. nigripes* may be recognised by its smaller size (wing 470—546 mm: after Baird, Brewer & Ridgway), by its uniform dusky plumage and black legs and feet, *D. albatrus* by its white plumage (when adult), except the tail and remiges which are slaty-brown, and straw-

yellow head, *D. exulans*, when adult, by its large size (wing 670—740 mm), white plumage with black remiges, and whitish legs and feet. The young of the two latter are dusky (the face of *D. exulans* white) and require more careful discrimination from *D. nigripes* (cf. Water B. N. Amer. 1884, II, 346; Cat. B. 1896, XXV, ll. cc.).

ORDER PYGOPODES.

This order should apparently be restricted to contain the Grebes and the Divers, as the *Alcae*, though very like in general appearance, are shown by Fürbringer and Gadow to deviate in many important points of structure in which the two groups might have been expected to agree.

The *Pygopodes* are natatorial birds, taking their food by diving, and are best characterized by their legs, which are situated so far back as to necessitate an almost upright carriage on land, where the bird rests upon the back of the tarsus as well as on the foot; by the very reduced tail which is hardly noticeable; by the small wings, rounded to fit the body; and by the straight, pointed bill, not serrated along the edges. The feet are either webbed *(Colymbidae)* or lobed *(Podicipedidae)*, the outer toe is as long or more often longer than the middle one, the hallux, when present, is small, lobated, and not united with the other toes. The eggs are unspotted, and the young are able to swim immediately after being hatched.

FAMILY PODICIPEDIDAE.

GENUS PODICEPS Lath.

The toes of the Grebes are four in number, lobated, i. e. furnished with broad side-flaps, the hallux small and situated on the inner side of the tarsus at a higher level than the anterior toes; the tarsus is much compressed and furnished with rugose scutellae along its hind edge upon which the bird rests; there is hardly any appreciable tail, what there is of it consisting of hair-like feathers; the wing is small, fitting the body, 12 primaries. The nest is a floating mass of decaying vegetation; the eggs are white, but soon become discoloured from the nest-materials, with which the bird also has the habit of concealing them on leaving the nest. The Grebes are almost cosmopolitan in range.

392. PODICEPS TRICOLOR (G. R. Gray.).

Moluccan Little Grebe.

a. **Podiceps (Sylbeocyclus) tricolor** *(1)* Gray, P. Z. S. 1860, 366.
Podiceps tricolor *(1)* Wall., P. Z. S. 1863, 36, 487; *(2)* Salvad., Orn. Pap. 1882, III, 470; *(3)* W. Blas., J. f. O. 1883, 140; *(4)* Pleske, Bull. Ac. Petersb. 1884, XII,

139; *(5)* W. Blas., Z. ges. Orn. 1886, 204; *(6)* Salvad., Orn. Pap. Agg. 1891, 213; *(7)* M. & Wg., Abh. Mus. Dresden 1894, Nr. 4, p. 3.

b. **Podiceps minor** (nec Gm.); *(1)* Schl., Mus. P.-B., Urinat., 1867, 45, part.; *(2)* Rosenb., Malay. Archip. 1878, 279; *(3)* Meyer, Ibis 1879, 145; ? *(4)* Ribbe, Jb. Ver. Erdk. Dresden 1892, 174.

c. **Podiceps minor** var. **tricolor** *(1)* Brügg., Abh. Ver. Bremen 1876, V, 98.

d. **Podiceps gularis** (nec Gld.); *(1)* Rosenb., Zool. Gart. 1881, 167; *(2)* id., Reistogt. in Gorontalo 1865, 66; ? *(3)* Joest, Holontalo 1883, 106.

e. **Colymbetes tricolor** *(1)* Heine & Rchw., Nomencl. Mus. Hein. 1890, 364.

"Maweres", Malay, Minahassa, Meyer *b 3*.

"Wangel", Meyer, or **"Bebek mudong"**, Nat. Coll., Minahassa.

"Tangulele" or **"Tongulele"**, Gorontalo, Rosenberg *b 2*, Joest *d 3*.

For further synonymy and references cf. Salvadori *2*.

Descriptions. Gray *a 1*; Salvadori *2*.

Adult. Head above, hind neck, and upper parts blackish, glossed with an indistinct colour; remiges dull brown, whitish below on basal part of feathers and on under wing-coverts; sides of rump ochraceous; face, ear-coverts, throat, and sides of neck chestnut, on chin blackish; remaining under parts dusky, on sides as dark as the upper surface, on breast and abdomen varied with wood-brown; bare skin around the gape and at base of lower mandible yellow; "iris carmine-red; bill black . . .; feet grey-green": Fischer *4* (adult, Main, Minahassa, 16. Feb. 1894: Nat. Coll. — C 13269).

Young. Face and neck striped with black and white; fore neck white varied with pale chestnut; some of the feathers of the crown with chestnut bases; breast and abdomen greyish white (juv. Main, Feb. 1894: Nat. Coll. — C 13271).

Another young example (apparently about a week older) from the same spot, has a triangular patch of white on the crown, bordered behind with chestnut; jugulum dusky; breast and abdomen white tinged with buff; bill, and legs and feet yellowish (C 13272).

Measurements (4 adults from N. Celebes). Wing (over the arc) 103—112 mm, (straight) 88—102; tail (feathers hair-like) ca. 25; tarsus 38; middle toe with claw ca. 48; exposed culmen 22—26.5.

Egg. Yellowish white (doubtless through discoloration); length 36 mm, breadth 24.5 (Ternate: Pleske *4*).

Distribution. Papuasia: — ? New Guinea and Aru (v. Rosenberg *6*), Kei (v. Rosenberg *b 1*); Moluccas: — Ceram (v. Rosenberg *6*, ? Ribbe *b 4*), Amboina (Hoedt *b 1*), Buru (Wallace *1*), Ternate and Halmahera (Bernst., etc. *b 1, 1, 6*); Celebes: — Minahassa (Meyer *b 3*, v. Musschenbroek and Nat. Coll. in Dresd. Mus.), Gorontalo Distr. (v. Rosenberg *b 2, c 1, d 1*, Riedel *5*); Flores (Wallace *1*); Timor (Wallace *1*, S. Müller *b 1*).

In the Island of Celebes this Grebe is at present known only from the Northern Peninsula, where it breeds, as is proved by two young specimens killed when incapable of flight before us. At Lake Lino, Minahassa, Meyer encountered it in large flocks in May, 1871. Its eggs have recently been obtained in Ternate by Fischer, as shown above, and it appears probable that it is a resident in all parts of the Archipelago where it occurs. In winter the Little Grebe of Europe and Asia, *P. minor* (Gm.), often called *P. philippensis* (Bonn.) in Eastern and Southern Asia, is not unlikely to occur in Celebes, as it has been recorded

from the Philippines and is only known as a summer visitor in some parts of China and of Japan. At present, however, *P. tricolor* is the only Grebe known to occur on the mainland of Celebes.

Schlegel united both *P. tricolor* and *P. gularis* with *P. minor*, and the two former have since occasionally been confused with one another or identified with *P. minor*. As Brüggemann and Count Salvadori have shown, *P. tricolor* is distinguishable from *P. minor* by several characters. The bill is much longer, the culmen straighter, there is a broader space of yellow at the base of the lower mandible, the blackish of the chin does not extend on to the upper throat and malar region, the secondaries are on the outer webs uniform brown (not white on the basal half thereof), the inner webs white laterally for only about half the width of the webs (instead of being here almost entirely white).

The secondaries and bill of *P. gularis* present the same differences with *P. tricolor* as do those of *P. minor;* it differs further from *P. tricolor* by its black face and upper throat, with a stripe of chestnut running from the corner of the eye one-third of the way down the side of the neck, and the lower breast and abdomen are silky white.

393. PODICEPS GULARIS J. Gd.

Black-throated Little Grebe.

a. ? **New Holland Grebe** *(1)* Lath., Gen. Hist. 1826, X, 33.

b. ? **Podiceps novae-hollandiae** *(1)* Steph., Gen. Zool. XIII, 18 (1826); *(2)* Brügg., Abh. Ver. Bremen 1876, V, 99; *(3)* Legge, B. Ceylon 1880, 1060; *(4)* Rams., Tab. List 1888, 22; *(5)* Cox & Hamil, Pr. L. Soc. N. S. W. 1889, 422; *(6)* North, Nests & Eggs B. Austr. 1889, 348.

Podiceps gularis *(1)* Gould, P. Z. S. 1836, 145; *(2)* Gray, List B. Br. Mus. 1848, pt. III, Anseres, etc., 151; *(III)* Gould, B. Austr. 1848, VII, pl. 81; *(IV)* Rchb., Nat. 1848, t. VIII (Spl. III), figs. 758—59; *(5)* Gld., Hb. B. Austr. 1865, II, 513; *(6)* Salvad., Orn. Pap. 1882, III, 469; *(7)* Rams., Pr. L. Soc. N. S. W. 1887, 173; *(8)* Salvad., Orn. Pap. Agg. 1891, 213; *(9)* M. & Wg., Abh. Mus. Dresden 1894, Nr. 4, p. 3.

c. **Podiceps minor** *(1)* Schlegel, Mus. P.-B., Urinat., 1867, 46, part.; ? *(2)* Wald., Tr. Z. S. 1872, VIII, 105.

d. **Podiceps tricolor** (nec Gray); *(1)* Vord., N. T. Ned. Ind. 1882, XLII, 119; *(2)* id., ib. 1884, XLIV, 205; ? *(3)* id., ib. 1886, XLVI, 222, ? *(4)* Everett, J. Str. Br. R. A. S. 1889, 212; *(5)* M. & Wg., J. f. O. 1894, 253.

e. **Tachybates gularis** *(1)* Madarász, Aquila 1894, 106.

"Tenggoka", Kabruang, Talaut, Nat. Coll.

"Bararang woki", Great Sangi, iid.

For further synonymy and references cf. Salvadori *6*.

Figures and descriptions. Gould *III, 5*; Reichenbach *IV*; Salvadori *6*; Vorderm. *d 1*.

Adult. Above dusky, glossed with some indistinct colour more pronounced on head; primaries dull brown, white on inner webs towards their bases; secondaries white, dull brown on exposed parts of the outer webs; cheeks, ear-coverts, chin, and upper throat black; a stripe of chestnut leading from the eye above the ear-coverts to nearly half-way down the side of the neck, on which it widens and nearly encloses the black of the throat; rest of neck and throat brown, duskier with the hairy tips

of the feathers white on the jugulum; sides and flanks browner; lower breast and abdomen silky white (ad., Kabruang, Talaut Is., Nov. 1893: Nat. Coll. — C 13024.

"Bill greenish grey, with a light ash-coloured spot at the extreme tip of the upper mandible; sides of the upper mandible from the tip to near the nostrils, and the tip of the lower mandible bluish grey; base of both mandibles yellowish grey; gape primrose-yellow; irides lemon-yellow; inner side of the tarsi yellowish grey, passing into greenish grey on the outer side and feet" (Australia — Gould *5*).

Immature. Differs from the adult in having the chin, upper throat and cheeks white; the chestnut stripe on the head and neck imperfect (Kabruang, Nov. 1893 — C 13025).

Measurements (5 adults from Talaut and 1 Sangi). Wing (over the arc) 100—112 mm, (straight) ca. 94—104; tarsus ca. 34; middle toe with claw ca. 50; exposed culmen 18—22 mm.

Eggs. 5, occasionally 6; bluish white when first laid, thinly coated with lime, but quickly becoming soiled with the wet and decaying weeds of which the nest is formed (North *b 6*).

Nest. Of sedges and other aquatic herbage, attached to a few reeds in the water (North *b 6*).

Distribution. Australia and Tasmania (Gould, Ramsay, etc. *1*, *III*, *5*, *b 4*, *b 5*, *b 6*); New Guinea (D'Albertis, Morton & Blunden *6*); Sangi Islands — Great Sangi (Nat. Coll. in Dresd. Mus.); Talaut Islands — Kabruang (Nat. Coll. *d 5*, *9*); Java (Vorderman *d 1*); ? Borneo (Vorderman *d 3*, *d 4*).

Until quite recently this little Grebe was known only from Australia and New Guinea, but in August, 1893, a specimen was sent to the Dresden Museum from Great Sangi, to be followed by a nice series shot in November the same year on Kabruang in the Talaut Islands. It was not included in two subsequent collections from that group. Previously to this Dr. Vorderman had described a bird from Java as *P. tricolor*, which is, however, obviously the present species; and we suppose his subsequent record under this name of a bird from Banjermassing, Borneo, must be *P. gularis* also. If so, it is probable that *P. gularis* will be found from Borneo to Tasmania. In Celebes, where *P. tricolor* occurs, *P. gularis* is not yet known; on the other hand, *P. tricolor* has not been sent to us from Sangi and Talaut, though *P. gularis* appears to be plentiful in the latter group.

This species is easily distinguishable from *P. tricolor* by its black chin, cheeks and upper throat, by a stripe, simply, of chestnut on the head and neck, by its white secondaries with only the part of the outer webs exposed on the closed wing brown, by its shorter bill, and its white belly. It has nearer affinities with *P. minor*, the Little Grebe of Europe, Africa and Asia, which has, however, the fore neck (except the lower part), the ear-coverts and sides of neck chestnut, as compared with the chestnut stripe starting narrowly from the corner of the eye and widening on the sides of the neck in the Australian or Black-throated Little Grebe, *Podiceps gularis*.

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Printers, Breitkopf & Härtel, Leipsic.

PUBLISHED BY R. FRIEDLÄNDER & SOHN, BERLIN.

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